



STIC Search Report

Biotech-Chem Library

STIC Database Tracking Number: 158020

TO: Ben Sackey
Location: 5b31 / 5c18
Tuesday, July 19, 2005
Art Unit: 1626
Phone: 571-272-0704
Serial Number: 10 / 676884

From: Jan Delaval
Location: Biotech-Chem Library
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Search Notes

SEARCH REQUEST FORM

Scientific and Technical Information Center

158620

Requester's Full Name: BEN JACK G Examiner #: 72489 Date: 6/30/05Art Unit: 1626 Phone Number 30-2-0704 Serial Number: 10/1676,884Mail Box and Bldg/Room Location: REM 5 B31 Results Format Preferred (circle): PAPER DISK E-MAIL**If more than one search is submitted, please prioritize searches in order of need.**

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Hydrothermally Synthesized Mo-Y-M-Nb-X oxide catalystInventors (please provide full names): Gaffney et al.

Earliest Priority Filing Date: _____

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

A process for producing a catalyst of formula:

$Mo_a V_b M_c Nb_d X_e O_f$ comprising admixing compds of Mo, V, M, Nb and X and solvent comprising H_2O to form a first admixture containing at least 2, but less than all of Mo, V, M, Nb and X

- ② heating the first admix at a temperature of $25^\circ C$ to $200^\circ C$ for 5 mins ~~to~~ 48 hours
- ③ then admixing Mo, V, M, Nb , and X with the first admixture to form a 2nd admixture
- ④ heating 2nd admixture at a temperature of $50^\circ C$ to $300^\circ C$ for 1 hour to several weeks in a closed vessel under pressure.
- ⑤ recovering insoluble material from closed vessel to obtain catalyst.

claims 2 and 7.

=> d his

(FILE 'HOME' ENTERED AT 13:34:26 ON 19 JUL 2005)
SET COST OFF

FILE 'HCAPLUS' ENTERED AT 13:34:33 ON 19 JUL 2005
 L1 1 S US20040063990/PN OR (US2003-676334# OR US2002-415288#)/AP,PRN
 E GAFFNEY A/AU
 L2 110 S E3,E4,E10,E11,E14,E15
 E SONG R/AU
 L3 65 S E3-E9
 E SONG RUO/AU
 L4 25 S E3,E10
 L5 8568 S ((ROHM? OR ROEHM?) (L) HAAS?)/PA,CS
 L6 51 S L2-L4 AND CATALY?/SC,SX
 L7 94 S L2-L4 AND CATALY?/CW,CT
 L8 91 S L2-L4 AND CAT/RL
 L9 108 S L6-L8
 L10 1 S L1 AND L2-L9
 SEL RN

FILE 'REGISTRY' ENTERED AT 13:38:38 ON 19 JUL 2005
 L11 46 S E1-E46
 L12 26 S L11 NOT TIS/CI
 L13 20 S L11 NOT L12
 L14 156 S (MO AND V AND NB AND O)/ELS AND (TE OR SB)/ELS
 L15 75 S L14 AND 6/ELC.SUB
 L16 125 S L14 AND (LI OR NA OR K OR RB OR CS OR MG OR CA OR SR OR BA OR
 L17 33 S L14 AND (BI OR SE OR F OR CL OR BR OR I OR PR OR ND OR SM OR
 L18 135 S L16,L17
 L19 63 S L18 AND L15
 L20 20 S L13 AND L19
 L21 43 S L19 NOT L20
 L22 25 S L21 AND SB/ELS
 L23 4 S L22 AND (TL OR GE OR AL OR SN)/ELS
 L24 21 S L22 NOT L23
 L25 18 S L21 NOT L22
 L26 59 S L20,L24,L25
 L27 76 S L18 NOT L26
 SAV L26 SACKEY676/A

FILE 'HCAOLD' ENTERED AT 14:14:48 ON 19 JUL 2005
 L28 0 S L26

FILE 'HCAPLUS' ENTERED AT 14:14:53 ON 19 JUL 2005
 L29 51 S L26
 L30 28 S L26 (L) PREP+NT/RL
 L31 11 S L1-L10 AND L30
 L32 46 S L29 AND (PD<=20021001 OR PRD<=20021001 OR AD<=20021001)
 L33 26 S L30 AND L32
 L34 10 S L31 AND L32
 L35 1 S L31 NOT L34
 L36 11 S L31,L34,L35
 L37 27 S L33,L36
 L38 20 S L32 NOT L37

FILE 'USPATFULL' ENTERED AT 14:20:33 ON 19 JUL 2005
 L39 44 S L26
 L40 0 S L39 AND B01J037/IPC
 L41 32 S L39 AND B01J/IPC

L42 41 S L39 AND (PD<=20021001 OR PRD<=20021001 OR AD<=20021001)
 L43 19 S L39 AND (GAFFNEY ? OR SONG ?)/AU
 L44 3 S L39 AND (ROHM? OR ROEHM?)/PA
 L45 29 S L41 AND L42
 L46 31 S L43,L44,L45
 L47 13 S L39,L42 NOT L46

=> fil reg
 FILE 'REGISTRY' ENTERED AT 14:23:31 ON 19 JUL 2005
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
 PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
 COPYRIGHT (C) 2005 American Chemical Society (ACS)

Property values tagged with IC are from the ZIC/VINITI data file
 provided by InfoChem.

STRUCTURE FILE UPDATES: 18 JUL 2005 HIGHEST RN 855828-45-4
 DICTIONARY FILE UPDATES: 18 JUL 2005 HIGHEST RN 855828-45-4

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 18, 2005

Please note that search-term pricing does apply when
 conducting SmartSELECT searches.

 *
 * The CA roles and document type information have been removed from *
 * the IDE default display format and the ED field has been added, *
 * effective March 20, 2005. A new display format, IDERL, is now *
 * available and contains the CA role and document type information. *
 *

Structure search iteration limits have been increased. See HELP SLIMITS
 for details.

Experimental and calculated property data are now available. For more
 information enter HELP PROP at an arrow prompt in the file or refer
 to the file summary sheet on the web at:
<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> d ide can tot 126

L26 ANSWER 1 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 766557-27-1 REGISTRY
 ED Entered STN: 21 Oct 2004
 CN Antimony molybdenum niobium silver vanadium oxide (9CI) (CA INDEX NAME)
 MF Ag . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
Sb	x	7440-36-0

Ag	x	7440-22-4
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 141:314762

L26 ANSWER 2 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 676365-89-2 REGISTRY
 ED Entered STN: 21 Apr 2004
 CN Chromium molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Cr . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cr	x	7440-47-3
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

L26 ANSWER 3 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 676365-88-1 REGISTRY
 ED Entered STN: 21 Apr 2004
 CN Calcium molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Ca . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
Ca	x	7440-70-2
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

L26 ANSWER 4 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 676365-87-0 REGISTRY

ED Entered STN: 21 Apr 2004
 CN Molybdenum niobium potassium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF K . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
K	x	7440-09-7
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

L26 ANSWER 5 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 676365-86-9 REGISTRY
 ED Entered STN: 21 Apr 2004
 CN Lithium molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Li . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7
Li	x	7439-93-2

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

L26 ANSWER 6 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 676365-85-8 REGISTRY
 ED Entered STN: 21 Apr 2004
 CN Molybdenum niobium rhodium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Rh . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2

Te	x	13494-80-9
V	x	7440-62-2
Rh	x	7440-16-6
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

L26 ANSWER 7 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 676365-84-7 REGISTRY
 ED Entered STN: 21 Apr 2004
 CN Molybdenum niobium platinum tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Pt . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Pt	x	7440-06-4
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

L26 ANSWER 8 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 675571-72-9 REGISTRY
 ED Entered STN: 15 Apr 2004
 CN Lead molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Pb . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, CASREACT, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7
Pb	x	7439-92-1

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 140:289191

L26 ANSWER 9 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
RN 511313-29-4 REGISTRY
ED Entered STN: 06 May 2003
CN Antimony gold molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
MF Au . Mo . Nb . O . Sb . V
CI TIS
SR CA
LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
Au	x	7440-57-5
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 141:314762

REFERENCE 2: 138:323030

L26 ANSWER 10 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
RN 420134-66-3 REGISTRY
ED Entered STN: 22 May 2002
CN Molybdenum niobium selenium tellurium vanadium oxide (9CI) (CA INDEX NAME)
MF Mo . Nb . O . Se . Te . V
CI TIS
SR CA
LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
Se	x	7782-49-2
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:355590

L26 ANSWER 11 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
RN 406681-68-3 REGISTRY
ED Entered STN: 23 Apr 2002
CN Gold molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
MF Au . Mo . Nb . O . Te . V
CI TIS
SR CA

LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Au	x	7440-57-5
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279833

L26 ANSWER 12 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 406681-67-2 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Molybdenum niobium silver tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Ag . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Ag	x	7440-22-4
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279833

L26 ANSWER 13 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 406681-66-1 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Copper molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Cu . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Cu	x	7440-50-8
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 138:122955

REFERENCE 2: 136:279833

L26 ANSWER 14 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 406675-88-5 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Molybdenum niobium rhenium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Re . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Re	x	7440-15-5
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279830

L26 ANSWER 15 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 406675-87-4 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Indium molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF In . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
In	x	7440-74-6
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

3 REFERENCES IN FILE CA (1907 TO DATE)
 3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 139:36960

REFERENCE 3: 136:279830

L26 ANSWER 16 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN

RN 406675-82-9 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Molybdenum niobium tellurium vanadium iodide oxide (9CI) (CA INDEX NAME)
 MF I . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
I	x	14362-44-8
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 136:279831

L26 ANSWER 17 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 406675-81-8 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Molybdenum niobium tellurium vanadium fluoride oxide (9CI) (CA INDEX NAME)
 MF F . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
F	x	14762-94-8
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279831

L26 ANSWER 18 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 406675-80-7 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Molybdenum niobium tellurium vanadium chloride oxide (9CI) (CA INDEX NAME)
 MF Cl . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
C1	x	22537-15-1
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 136:279831

L26 ANSWER 19 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN

RN 406675-79-4 REGISTRY

ED Entered STN: 23 Apr 2002

CN Molybdenum niobium tellurium vanadium bromide oxide (9CI) (CA INDEX NAME)

MF Br . Mo . Nb . O . Te . V

CI TIS

SR CA

LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
Br	x	10097-32-2
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 136:279831

L26 ANSWER 20 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN

RN 406675-66-9 REGISTRY

ED Entered STN: 23 Apr 2002

CN Iridium molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)

MF Ir . Mo . Nb . O . Te . V

CI TIS

SR CA

LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

Ir	x	7439-88-5
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1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279832

L26 ANSWER 21 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 406675-58-9 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Molybdenum niobium tellurium vanadium yttrium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Te . V . Y
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
Y	x	7440-65-5
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279834

L26 ANSWER 22 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 406675-50-1 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Gallium molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Ga . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Ga	x	7440-55-3
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279829

L26 ANSWER 23 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 406675-48-7 REGISTRY
 ED Entered STN: 23 Apr 2002
 CN Molybdenum niobium tellurium vanadium zinc oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Te . V . Zn

CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
Zn	x	7440-66-6
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 136:279829

L26 ANSWER 24 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 380413-74-1 REGISTRY
 ED Entered STN: 04 Jan 2002
 CN Molybdenum niobium tellurium titanium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Te . Ti . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Ti	x	7440-32-6
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 137:79353

REFERENCE 2: 136:38031

L26 ANSWER 25 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 380413-67-2 REGISTRY
 ED Entered STN: 04 Jan 2002
 CN Antimony molybdenum niobium titanium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Sb . Ti . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number

O	x	17778-80-2
V	x	7440-62-2
Sb	x	7440-36-0
Ti	x	7440-32-6
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 137:79353

REFERENCE 2: 136:38031

L26 ANSWER 26 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 363610-76-8 REGISTRY
 ED Entered STN: 22 Oct 2001
 CN Antimony boron molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
 MF B . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
B	x	7440-42-8
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 135:278674

L26 ANSWER 27 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 347143-00-4 REGISTRY
 ED Entered STN: 20 Jul 2001
 CN Hafnium alloy, nonbase, Hf,Mo,Nb,O,Sb,V (9CI) (CA INDEX NAME)
 MF Hf . Mo . Nb . O . Sb . V
 CI AYS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Component Registry Number
Hf	7440-58-6
Mo	7439-98-7
Nb	7440-03-1
O	17778-80-2
Sb	7440-36-0
V	7440-62-2

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 135:77251

L26 ANSWER 28 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 347142-99-8 REGISTRY
 ED Entered STN: 20 Jul 2001
 CN Molybdenum alloy, nonbase, Mo,Nb,O,Re,Sb,V (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Re . Sb . V
 CI AYS
 SR CA
 LC STN Files: CA, CAPLUS

Component Component
 Registry Number

=====+=====	
Mo	7439-98-7
Nb	7440-03-1
O	17778-80-2
Re	7440-15-5
Sb	7440-36-0
V	7440-62-2

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 135:77251

L26 ANSWER 29 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 292139-85-6 REGISTRY
 ED Entered STN: 03 Oct 2000
 CN Antimony copper molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
 MF Cu . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
Cu	x	7440-50-8
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 138:238549

REFERENCE 2: 133:223163

L26 ANSWER 30 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 292139-84-5 REGISTRY
 ED Entered STN: 03 Oct 2000
 CN Antimony molybdenum niobium selenium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Sb . Se . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Ratio	Component Registry Number
O	x	17778-80-2
Se	x	7782-49-2
V	x	7440-62-2
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 133:223163

L26 ANSWER 31 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 275817-40-8 REGISTRY
 ED Entered STN: 10 Jul 2000
 CN Molybdenum niobium tellurium vanadium zirconium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Te . V . Zr
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
Zr	x	7440-67-7
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 141:88666

REFERENCE 2: 133:43945

L26 ANSWER 32 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 261919-86-2 REGISTRY
 ED Entered STN: 14 Apr 2000
 CN Antimony gallium molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
 MF Ga . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
Ga	x	7440-55-3
Sb	x	7440-36-0
Nb	x	7440-03-1

Mo	x	7439-98-7
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3 REFERENCES IN FILE CA (1907 TO DATE)
 3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 141:314762

REFERENCE 2: 139:36960

REFERENCE 3: 132:237515

L26 ANSWER 33 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 260557-95-7 REGISTRY
 ED Entered STN: 03 Apr 2000
 CN Antimony bismuth molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
 MF Bi . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Bi	x	7440-69-9
V	x	7440-62-2
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

4 REFERENCES IN FILE CA (1907 TO DATE)
 4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 141:314762

REFERENCE 2: 140:170371

REFERENCE 3: 135:242659

REFERENCE 4: 132:208269

L26 ANSWER 34 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 250211-95-1 REGISTRY
 ED Entered STN: 07 Dec 1999
 CN Antimony lithium molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
 MF Li . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7
Li	x	7439-93-2

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 131:342549

L26 ANSWER 35 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 224324-73-6 REGISTRY
 ED Entered STN: 11 Jun 1999
 CN Molybdenum niobium scandium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Sc . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Sc	x	7440-20-2
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279834

REFERENCE 2: 130:338521

L26 ANSWER 36 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 224324-60-1 REGISTRY
 ED Entered STN: 11 Jun 1999
 CN Molybdenum niobium tellurium terbium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Tb . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Tb	x	7440-27-9
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279834

REFERENCE 2: 130:338521

L26 ANSWER 37 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 224324-51-0 REGISTRY

ED Entered STN: 11 Jun 1999
 CN Molybdenum niobium praseodymium tellurium vanadium oxide (9CI) (CA INDEX
NAME)
 MF Mo . Nb . O . Pr . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Pr	x	7440-10-0
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279834

REFERENCE 2: 130:338521

L26 ANSWER 38 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 224324-48-5 REGISTRY
 ED Entered STN: 11 Jun 1999
 CN Lanthanum molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX
NAME)
 MF La . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7
La	x	7439-91-0

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 130:338521

L26 ANSWER 39 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 224324-44-1 REGISTRY
 ED Entered STN: 11 Jun 1999
 CN Molybdenum niobium samarium tellurium vanadium oxide (9CI) (CA INDEX
NAME)
 MF Mo . Nb . O . Sm . Te . V
 CI TIS
 SR CA

LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Sm	x	7440-19-9
Nb	x	7440-03-1
Mo	x	7439-98-7

4 REFERENCES IN FILE CA (1907 TO DATE)
 4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 137:338387

REFERENCE 3: 136:279832

REFERENCE 4: 130:338521

L26 ANSWER 40 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 224324-37-2 REGISTRY
 ED Entered STN: 11 Jun 1999
 CN Molybdenum neodymium niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . Nd . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Nd	x	7440-00-8
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:279834

REFERENCE 2: 130:338521

L26 ANSWER 41 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 210831-87-1 REGISTRY
 ED Entered STN: 03 Sep 1998
 CN Antimony molybdenum nickel niobium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . Ni . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Ratio	Component
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		Registry Number
O	x	17778-80-2
V	x	7440-62-2
Sb	x	7440-36-0
Nb	x	7440-03-1
Ni	x	7440-02-0
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 129:149337

L26 ANSWER 42 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 210831-85-9 REGISTRY
 ED Entered STN: 03 Sep 1998
 CN Antimony cobalt molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
 MF Co . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
Co	x	7440-48-4
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 129:149337

L26 ANSWER 43 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 210831-51-9 REGISTRY
 ED Entered STN: 03 Sep 1998
 CN Antimony molybdenum niobium vanadium zirconium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Sb . V . Zr
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
V	x	7440-62-2
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 141:88666

REFERENCE 2: 129:149337

L26 ANSWER 44 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 207616-02-2 REGISTRY
 ED Entered STN: 25 Jun 1998
 CN Antimony molybdenum niobium rubidium vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Rb . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
Sb	x	7440-36-0
Rb	x	7440-17-7
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 129:15908

L26 ANSWER 45 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 207616-00-0 REGISTRY
 ED Entered STN: 25 Jun 1998
 CN Antimony molybdenum niobium phosphorus vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . P . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
P	x	7723-14-0
V	x	7440-62-2
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 129:15908

L26 ANSWER 46 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 207615-99-4 REGISTRY
 ED Entered STN: 25 Jun 1998
 CN Antimony molybdenum niobium potassium vanadium oxide (9CI) (CA INDEX NAME)
 MF K . Mo . Nb . O . Sb . V

CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
Sb	x	7440-36-0
K	x	7440-09-7
Nb	x	7440-03-1
Mo	x	7439-98-7

3 REFERENCES IN FILE CA (1907 TO DATE)
 3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 141:173662

REFERENCE 2: 134:237954

REFERENCE 3: 129:15908

L26 ANSWER 47 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 204920-27-4 REGISTRY
 ED Entered STN: 30 Apr 1998
 CN Antimony cerium molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
 MF Ce . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Ratio	Component Registry Number
O	x	17778-80-2
V	x	7440-62-2
Ce	x	7440-45-1
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

3 REFERENCES IN FILE CA (1907 TO DATE)
 3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 136:118213

REFERENCE 2: 129:149337

REFERENCE 3: 128:244499

L26 ANSWER 48 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 204125-27-9 REGISTRY
 ED Entered STN: 15 Apr 1998
 CN Molybdenum niobium tellurium tungsten vanadium oxide (9CI) (CA INDEX NAME)
 MF Mo . Nb . O . Te . V . W
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
W	x	7440-33-7
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 135:167166

REFERENCE 2: 128:209443

L26 ANSWER 49 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 202708-41-6 REGISTRY
 ED Entered STN: 17 Mar 1998
 CN Antimony calcium molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
 MF Ca . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS

Component	Ratio	Component Registry Number
O	x	17778-80-2
Ca	x	7440-70-2
V	x	7440-62-2
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

3 REFERENCES IN FILE CA (1907 TO DATE)
 3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 133:335477

REFERENCE 2: 131:342549

REFERENCE 3: 128:155780

L26 ANSWER 50 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 198018-04-1 REGISTRY
 ED Entered STN: 03 Dec 1997
 CN Antimony iron molybdenum niobium vanadium oxide (9CI) (CA INDEX NAME)
 DR 380413-73-0
 MF Fe . Mo . Nb . O . Sb . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2

V	x	7440-62-2
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7
Fe	x	7439-89-6

5 REFERENCES IN FILE CA (1907 TO DATE)
 5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 137:389686

REFERENCE 2: 136:38031

REFERENCE 3: 129:149337

REFERENCE 4: 129:17245

REFERENCE 5: 127:331206

L26 ANSWER 51 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN

RN 149920-42-3 REGISTRY

ED Entered STN: 10 Sep 1993

CN Molybdenum niobium palladium tellurium vanadium oxide (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Telluric acid, molybdenum niobium palladium vanadium salt

MF Mo . Nb . O . Pd . Te . V

CI TIS

SR CA

LC STN Files: CA, CAPLUS, CASREACT, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Pd	x	7440-05-3
Nb	x	7440-03-1
Mo	x	7439-98-7

8 REFERENCES IN FILE CA (1907 TO DATE)
 8 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 142:482462

REFERENCE 2: 142:447536

REFERENCE 3: 141:43516

REFERENCE 4: 140:305763

REFERENCE 5: 140:289191

REFERENCE 6: 136:279833

REFERENCE 7: 124:147122

REFERENCE 8: 119:139968

L26 ANSWER 52 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
RN 149920-41-2 REGISTRY
ED Entered STN: 10 Sep 1993
CN Boron molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN Molybdenum niobium vanadium borate tellurate
MF B . Mo . Nb . O . Te . V
CI TIS
SR CA
LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
B	x	7440-42-8
Nb	x	7440-03-1
Mo	x	7439-98-7

1 REFERENCES IN FILE CA (1907 TO DATE)
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 119:139968

L26 ANSWER 53 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
RN 149920-40-1 REGISTRY
ED Entered STN: 10 Sep 1993
CN Bismuth molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN Telluric acid, bismuth molybdenum niobium vanadium salt
MF Bi . Mo . Nb . O . Te . V
CI TIS
SR CA
LC STN Files: CA, CAPLUS, CASREACT, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
Bi	x	7440-69-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7

5 REFERENCES IN FILE CA (1907 TO DATE)
5 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:289191

REFERENCE 2: 136:355590

REFERENCE 3: 136:6499

REFERENCE 4: 122:266250

REFERENCE 5: 119:139968

L26 ANSWER 54 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 149920-38-7 REGISTRY
 ED Entered STN: 10 Sep 1993
 CN Antimony molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Telluric acid, antimony molybdenum niobium vanadium salt
 MF Mo . Nb . O . Sb . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Sb	x	7440-36-0
Nb	x	7440-03-1
Mo	x	7439-98-7

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 139:74539

REFERENCE 2: 119:139968

L26 ANSWER 55 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 146569-70-2 REGISTRY
 ED Entered STN: 23 Mar 1993
 CN Manganese molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Telluric acid, manganese molybdenum niobium vanadium salt
 MF Mn . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, CASREACT, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7
Mn	x	7439-96-5

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 118:149827

L26 ANSWER 56 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 146569-69-9 REGISTRY

ED Entered STN: 23 Mar 1993
 CN Molybdenum nickel niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 OTHER CA INDEX NAMES:
 CN Telluric acid, molybdenum nickel niobium vanadium salt
 MF Mo . Nb . Ni . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, CASREACT, USPAT2, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Ni	x	7440-02-0
Mo	x	7439-98-7

4 REFERENCES IN FILE CA (1907 TO DATE)
 4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763
 REFERENCE 2: 140:289191
 REFERENCE 3: 136:279833
 REFERENCE 4: 118:149827

L26 ANSWER 57 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 146569-68-8 REGISTRY
 ED Entered STN: 23 Mar 1993
 CN Magnesium molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 OTHER CA INDEX NAMES:
 CN Telluric acid, magnesium molybdenum niobium vanadium salt
 MF Mg . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, CASREACT, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7
Mg	x	7439-95-4

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763
 REFERENCE 2: 118:149827

L26 ANSWER 58 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN

RN 146569-67-7 REGISTRY
 ED Entered STN: 23 Mar 1993
 CN Iron molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 OTHER CA INDEX NAMES:
 CN Telluric acid, iron molybdenum niobium vanadium salt
 MF Fe . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, CASREACT, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Nb	x	7440-03-1
Mo	x	7439-98-7
Fe	x	7439-89-6

2 REFERENCES IN FILE CA (1907 TO DATE)
 2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 118:149827

L26 ANSWER 59 OF 59 REGISTRY COPYRIGHT 2005 ACS on STN
 RN 146569-65-5 REGISTRY
 ED Entered STN: 23 Mar 1993
 CN Cobalt molybdenum niobium tellurium vanadium oxide (9CI) (CA INDEX NAME)
 OTHER CA INDEX NAMES:
 CN Telluric acid, cobalt molybdenum niobium vanadium salt
 MF Co . Mo . Nb . O . Te . V
 CI TIS
 SR CA
 LC STN Files: CA, CAPLUS, CASREACT, USPATFULL

Component	Ratio	Component Registry Number
O	x	17778-80-2
Te	x	13494-80-9
V	x	7440-62-2
Co	x	7440-48-4
Nb	x	7440-03-1
Mo	x	7439-98-7

4 REFERENCES IN FILE CA (1907 TO DATE)
 4 REFERENCES IN FILE CAPLUS (1907 TO DATE)

REFERENCE 1: 140:305763

REFERENCE 2: 140:289191

REFERENCE 3: 129:28336

REFERENCE 4: 118:149827

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L37 ANSWER 1 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:447045 HCAPLUS
DN 142:482462
ED Entered STN: 26 May 2005
TI Catalyst systems for converting alkanes to alkenes and to their corresponding oxygenated products
IN Benderly, Abraham; Chadda, Nitin; Gaffney, Anne Mae; Han, Scott; Le, Dominique Hung Nhu; Silvano, Mark Anthony
PA Rohm and Haas Company, USA
SO Eur. Pat. Appl., 27 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM B01J023-648
ICS B01J023-62; B01J023-54; B01J035-04
CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1533029	A1	20050525	EP 2004-257151	20041118
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR, IS, YU				
	JP 2005144432	A2	20050609	JP 2004-93680	20040326
	US 2005131255	A1	20050616	US 2004-987367	20041112
PRAI	US 2003-523297P	P	20031118		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1533029	ICM	B01J023-648
	ICS	B01J023-62; B01J023-54; B01J035-04
JP 2005144432	FTERM	4G069/AA03; 4G069/AA08; 4G069/BA01A; 4G069/BA01B;

4G069/BA02A; 4G069/BA04A; 4G069/BA05A; 4G069/BA07A;
 4G069/BB04A; 4G069/BB04B; 4G069/BB06A; 4G069/BB06B;
 4G069/BB08A; 4G069/BB10A; 4G069/BC01A; 4G069/BC08A;
 4G069/BC10A; 4G069/BC15A; 4G069/BC18A; 4G069/BC18B;
 4G069/BC25A; 4G069/BC26A; 4G069/BC30A; 4G069/BC31A;
 4G069/BC32A; 4G069/BC33A; 4G069/BC34A; 4G069/BC35A;
 4G069/BC36A; 4G069/BC38A; 4G069/BC44A; 4G069/BC51A;
 4G069/BC54A; 4G069/BC54B; 4G069/BC55A; 4G069/BC55B;
 4G069/BC56A; 4G069/BC58A; 4G069/BC59B; 4G069/BC62A;
 4G069/BC66A; 4G069/BC67A; 4G069/BC68A; 4G069/BC70A;
 4G069/BC71A; 4G069/BC72A; 4G069/BC72B; 4G069/BC74A;
 4G069/BC75A; 4G069/BC75B; 4G069/BD07A; 4G069/BD10B;
 4G069/BD12A; 4G069/BD15A; 4G069/CB07; 4G069/CB17;
 4G069/CB63; 4G069/FA01; 4G069/FB04; 4G069/FC10;
 4G169/AA03; 4G169/AA08; 4G169/BA01A; 4G169/BA01B;
 4G169/BA02A; 4G169/BA04A; 4G169/BA05A; 4G169/BA07A;
 4G169/BB04A; 4G169/BB04B; 4G169/BB06A; 4G169/BB06B;
 4G169/BB08A; 4G169/BB10A; 4G169/BC01A; 4G169/BC08A;
 4G169/BC10A; 4G169/BC15A; 4G169/BC18A; 4G169/BC18B;
 4G169/BC25A; 4G169/BC26A; 4G169/BC30A; 4G169/BC31A;
 4G169/BC32A; 4G169/BC33A; 4G169/BC34A; 4G169/BC35A;
 4G169/BC36A; 4G169/BC38A; 4G169/BC44A; 4G169/BC51A;
 4G169/BC54A; 4G169/BC54B; 4G169/BC55A; 4G169/BC55B;
 4G169/BC56A; 4G169/BC58A; 4G169/BC59B; 4G169/BC62A;
 4G169/BC66A; 4G169/BC67A; 4G169/BC68A; 4G169/BC70A;
 4G169/BC71A; 4G169/BC72A; 4G169/BC72B; 4G169/BC74A;
 4G169/BC75A; 4G169/BC75B; 4G169/BD07A; 4G169/BD10B;
 4G169/BD12A; 4G169/BD15A; 4G169/CB07; 4G169/CB17;
 4G169/CB63; 4G169/FA01; 4G169/FB04; 4G169/FC10;
 4H006/AA02; 4H006/AC12; 4H006/AC46; 4H006/BA06;
 4H006/BA09; 4H006/BA12; 4H006/BA26; 4H006/BA55;
 4H006/BA60; 4H006/BA81; 4H006/BC10; 4H006/BC13;
 4H006/BC19; 4H006/BD33; 4H006/BD52; 4H006/BE30;
 4H006/BS10; 4H039/CA20; 4H039/CA65; 4H039/CC10;
 4H039/CC30

US 2005131255 NCL 562/546.000; 502/311.000; 502/334.000; 502/208.000;
 585/616.000; 585/621.000; 585/627.000

AB Alkenes, unsatd. saturated carboxylic acids, saturated carboxylic acids and their

higher analogs are prepared directly from corresponding alkanes utilizing using a mixed bed catalyst at flame temps. in a short contact time reactor. Thus, 8% hexachloroplatinic acid was spiked with indium nitrate pentahydrate, 1.827 g alumina foam monolith was immersed on the resulting catalyst solution at room temperature for 1 h, dried at 100° for 1 h, calcined at 600° for 4 h, the process was repeated twice to give a platinum-indium oxide supported on alumina foam monolith (Pt/In = 10:1), which was used for propane conversion, giving conversion ratio 64% and propylene yield 21%.

ST catalyst system alkane converting alkene oxygenated product; hexachloroplatinic acid indium nitrate pentahydrate reactant; platinum indium oxide supported alumina catalyst propane conversion propylene

IT Oxides (inorganic), uses

RL: CAT (Catalyst use); USES (Uses)
 (catalysts; preparation of catalyst systems for converting alkanes to alkenes and to their corresponding oxygenated products)

IT Catalyst supports

Catalysts
 (preparation of catalyst systems for converting alkanes to alkenes and to their corresponding oxygenated products)

IT Alkenes, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)
 (preparation of catalyst systems for converting alkanes to alkenes and to
 their corresponding oxygenated products)

IT Carboxylic acids, miscellaneous
 RL: MSC (Miscellaneous)
 (preparation of catalyst systems for converting alkanes to alkenes and to
 their corresponding oxygenated products)

IT Alkanes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of catalyst systems for converting alkanes to alkenes and to
 their corresponding oxygenated products)

IT Carboxylic acids, miscellaneous
 RL: MSC (Miscellaneous)
 (unsatd., esters; preparation of catalyst systems for converting alkanes to
 alkenes and to their corresponding oxygenated products)

IT Carboxylic acids, miscellaneous
 RL: MSC (Miscellaneous)
 (unsatd.; preparation of catalyst systems for converting alkanes to alkenes
 and to their corresponding oxygenated products)

IT 1344-28-1, Alumina, uses
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst support; preparation of catalyst systems for converting alkanes to
 alkenes and to their corresponding oxygenated products)

IT 7440-06-4, Platinum, uses
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst; preparation of catalyst systems for converting alkanes to alkenes
 and to their corresponding oxygenated products)

IT 149920-42-3P 852178-33-7P, Indium platinum oxide 852178-34-8P,
 Niobium platinum oxide 852178-35-9P, Niobium palladium vanadium oxide
 RL: CAT (Catalyst use); IMF (Industrial manufacture);
 PREP (Preparation); USES (Uses)
 (catalyst; preparation of catalyst systems for converting alkanes to alkenes
 and to their corresponding oxygenated products)

IT 207398-97-8
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (catalyst; preparation of catalyst systems for converting alkanes to alkenes
 and to their corresponding oxygenated products)

IT 115-07-1P, Propylene, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (preparation of catalyst systems for converting alkanes to alkenes and to
 their corresponding oxygenated products)

IT 75-28-5, Isobutane 79-10-7, Acrylic acid, miscellaneous 79-41-4,
 Methacrylic acid, miscellaneous 106-97-8, Butane, miscellaneous
 115-11-7, Isobutylene, miscellaneous 25167-67-3, Butylene
 RL: MSC (Miscellaneous)
 (preparation of catalyst systems for converting alkanes to alkenes and to
 their corresponding oxygenated products)

IT 74-98-6, Propane, reactions 144-62-7, Oxalic acid, reactions
 7697-37-2, Nitric acid, reactions 7803-55-6, Ammonium metavanadate
 11120-48-2, Telluric acid 12054-85-2 16941-12-1, Hexachloroplatinic
 acid 38882-00-7 207596-32-5 264924-29-0
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of catalyst systems for converting alkanes to alkenes and to
 their corresponding oxygenated products)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Duhaut, P; US 3793232 A 1974 HCPLUS
 (2) Johnson Matthey Japan Ltd; EP 0960649 A 1999 HCPLUS
 (3) Michel; US 3909393 A 1975 HCPLUS
 (4) Phillips Petroleum Cy; FR 2103122 A 1972 HCPLUS

(5) Total Raffinage Distribution S A; EP 0864359 A 1998 HCPLUS

L37 ANSWER 2 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:493596 HCPLUS
 DN 141:43516
 ED Entered STN: 18 Jun 2004
 TI NOx treated mixed metal oxide catalyst
 IN Gaffney, Anne Mae; Heffner, Michele Doreen; Song, Ruozhi
 PA USA
 SO U.S. Pat. Appl. Publ., 15 pp., Cont.-in-part of Ser. No. 116,241.

CODEN: USXXCO

DT Patent

LA English

IC ICM B01J023-00

ICS C07C051-16

INCL 562546000; 562547000; 502302000

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

Section cross-reference(s): 35

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004116737	A1	20040617	US 2003-731523	20031209 <--
	US 2002183547	A1	20021205	US 2002-116241	20020404 <--
	US 6818588	B2	20041116		
	US 2004116731	A1	20040617	US 2003-722710	20031125 <--
	US 6916945	B2	20050712		
PRAI	US 2001-283260P	P	20010412	<--	
	US 2002-116241	A2	20020404	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	US 2004116737	ICM	B01J023-00
		ICS	C07C051-16
		INCL	562546000; 562547000; 502302000
	US 2004116737	NCL	562/546.000; 562/547.000; 502/302.000
		ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J027/057T; C07C051/25B+57/03; C07C253/24
	US 2002183547	NCL	502/311.000
		ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J027/057T; C07C051/25B+57/03; C07C253/24
	US 2004116731	NCL	558/320.000; 502/312.000; 562/545.000
		ECLA	B01J023/00B; B01J023/28; B01J027/057T; C07C051/25B+57/03; C07C253/24; B01J023/20

AB An improved catalyst comprising a mixed metal oxide, either promoted or not, is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsatd. carboxylic acid and for the vapor phase ammoxidn. of an alkane or a mixture of an alkane and an alkene to an unsatd. nitrile. Thus, 10 mL 5% aqueous nitric acid and 50 mL an aqueous solution containing

niobium oxalate (0.25 M Nb) and 0.31 M oxalic acid was added into an 100 mL aqueous solution containing ammonium heptamolybdate tetrahydrate (1.0 M Mo), ammonium metavanadate (0.3 M V), and telluric acid (0.23 M Te) and stirred, water was removed at 50° under 20 mmHg, the solid material was dried at 25° in a vacuum oven, calcined at 275° in an air atmospheric, and calcined at 600° under argon atmospheric to give a catalyst,

which was used as a catalyst for oxidation of propane at 390° under steam and air (propane:steam:air = 1:3:96), giving acrylic acid with yield 34% and C3 conversion 63%.

ST NOx treated mixed metal oxide catalyst; niobium oxalate ammonium heptamolybdate tetrahydrate metavanadate telluric acid reactant; nitric acid treated molybdenum niobium tellurium vanadium oxide catalyst; propane catalytic oxidn acrylic acid prepn

IT Oxidation catalysts
 (gas-phase; preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT Ammonoxidation
 Ammonoxidation catalysts
 Calcination
 (preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT Oxides (inorganic), uses
 RL: CAT (Catalyst use); USES (Uses)
 (preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT Alkanes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT Alkenes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT Carboxylic acids, preparation
 Nitriles, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (unsatd.; preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT 146569-48-4P, Molybdenum niobium tellurium vanadium oxide
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PEP
 (Physical, engineering or chemical process); PYP (Physical process); PREP
 (Preparation); PROC (Process); USES (Uses)
 (preparation of NOx treated mixed metal oxide catalysts)

IT 7803-55-6, Ammonium metavanadate 11120-48-2, Telluric acid 12054-85-2
 21348-59-4, Niobium oxalate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of NOx treated mixed metal oxide catalysts)

IT 149920-42-3P, Molybdenum niobium palladium tellurium vanadium oxide
 RL: CAT (Catalyst use); IMF (Industrial manufacture);
 PEP (Physical, engineering or chemical process); PYP (Physical process);
 PREP (Preparation); PROC (Process); USES (Uses)
 (preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT 79-10-7P, Acrylic acid, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT 11104-93-1, NOx, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT 6484-52-2, Ammonium nitrate, miscellaneous 7697-37-2, Nitric acid, miscellaneous 10102-43-9, Nitrogen oxide (NO), miscellaneous 10102-44-0, Nitrogen oxide (NO₂), miscellaneous 13446-48-5, Ammonium nitrite
 RL: MSC (Miscellaneous)
 (preparation of NOx treated mixed metal oxide catalysts useful for vapor oxidation of alkane to unsatd. carboxylic acids)

IT 74-98-6, Propane, reactions 7664-41-7, Ammonia, reactions 10102-05-3D,
 Palladium nitrate, hydrate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of NO_x treated mixed metal oxide catalysts useful for vapor
 oxidation of alkane to unsatd. carboxylic acids)

L37 ANSWER 3 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:269923 HCAPLUS
 DN 140:305763
 ED Entered STN: 02 Apr 2004
 TI Hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the selective
 oxidation of hydrocarbons
 IN Gaffney, Anne Mae; Song, Ruozhi
 PA USA
 SO U.S. Pat. Appl. Publ., 21 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 IC ICM B01J027-128
 ICS B01J027-132; B01J027-135; B01J027-06; B01J027-13; B01J027-125;
 B01J027-192; B01J027-19; B01J027-188; B01J027-198; B01J027-199;
 B01J027-187; B01J027-186; B01J027-14
 INCL 558322000; 502312000; 502224000; 502227000; 502228000; 502229000;
 502230000; 502231000; 502208000; 502209000
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004063990	A1	20040401	US 2003-676884	20030930 <--
	EP 1407819	A2	20040414	EP 2003-255811	20030917 <--
	EP 1407819	A3	20040623		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	BR 2003004188	A	20040831	BR 2003-4188	20030922 <--
	JP 2004148302	A2	20040527	JP 2003-340313	20030930 <--
PRAI	US 2002-415288P	P	20021001	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US	2004063990	ICM	B01J027-128
		ICS	B01J027-132; B01J027-135; B01J027-06; B01J027-13; B01J027-125; B01J027-192; B01J027-19; B01J027-188; B01J027-198; B01J027-199; B01J027-187; B01J027-186; B01J027-14
		INCL	558322000; 502312000; 502224000; 502227000; 502228000; 502229000; 502230000; 502231000; 502208000; 502209000
US	2004063990	NCL	558/322.000; 502/312.000; 502/224.000; 502/227.000; 502/228.000; 502/229.000; 502/230.000; 502/231.000; 502/208.000; 502/209.000
		ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J023/34; B01J023/652D; B01J023/887K; B01J027/057T; B01J037/10; C07C051/215+57/04; C07C253/24; C07C253/26 <--
EP	1407819	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J023/34; B01J023/652D; B01J023/887K; B01J027/057T; B01J027/132; B01J037/10; C07C051/215+57/04; C07C253/24; C07C253/26 <--
JP	2004148302	FTERM	4G069/AA02; 4G069/AA08; 4G069/BB06A; 4G069/BB06B; 4G069/BC01A; 4G069/BC03A; 4G069/BC03B; 4G069/BC04A; 4G069/BC04B; 4G069/BC08A; 4G069/BC09A; 4G069/BC09B;

4G069/BC10A; 4G069/BC10B; 4G069/BC17A; 4G069/BC18A;
 4G069/BC18B; 4G069/BC21A; 4G069/BC21B; 4G069/BC24A;
 4G069/BC30A; 4G069/BC35A; 4G069/BC35B; 4G069/BC38A;
 4G069/BC42A; 4G069/BC42B; 4G069/BC44A; 4G069/BC44B;
 4G069/BC49A; 4G069/BC53A; 4G069/BC54A; 4G069/BC54B;
 4G069/BC55A; 4G069/BC55B; 4G069/BC58A; 4G069/BC58B;
 4G069/BC59A; 4G069/BC59B; 4G069/BC61A; 4G069/BC62A;
 4G069/BC62B; 4G069/BC66A; 4G069/BC66B; 4G069/BC67A;
 4G069/BC67B; 4G069/BC68A; 4G069/BC68B; 4G069/BC69A;
 4G069/BC71A; 4G069/BC71B; 4G069/BC72A; 4G069/BC72B;
 4G069/BC75A; 4G069/BC75B; 4G069/BD03A; 4G069/BD07A;
 4G069/BD09A; 4G069/BD10A; 4G069/BD10B; 4G069/BD12A;
 4G069/BD12B; 4G069/BD13A; 4G069/BD13B; 4G069/BD14A;
 4G069/BD14B; 4G069/BD15A; 4G069/CB07; 4G069/CB53;
 4G069/CB54; 4G069/CB74; 4G069/FB04; 4H006/AA02;
 4H006/AC46; 4H006/BA12; 4H006/BA14; 4H006/BA15;
 4H006/BA25; 4H006/BA30; 4H006/BB62; 4H006/BC31;
 4H006/BC35; 4H006/BE30; 4H039/CA65; 4H039/CC10;
 4H039/CC30

<--

AB Hydrothermally synthesized catalysts comprising a mixed metal oxide are utilized to produce unsatd. carboxylic acids by the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, in the presence thereof; or to produce unsatd. nitriles by the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, and ammonia in the presence thereof.

ST mixed metal oxide oxidn catalyst unsatd acid nitrile

IT Ammonoxidation

Oxidation

(gas-phase; hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the selective oxidation of hydrocarbons)

IT Oxidation catalysts

(hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the selective oxidation of hydrocarbons)

IT Alkanes, reactions

Alkenes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the selective oxidation of hydrocarbons)

IT Oxides (inorganic), uses

RL: CAT (Catalyst use); USES (Uses)

(mixed metal; hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the selective oxidation of hydrocarbons)

IT Carboxylic acids, preparation

Nitriles, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(unsatd.; hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the selective oxidation of hydrocarbons)

IT 146569-65-5P, Cobalt molybdenum niobium tellurium vanadium oxide

146569-67-7P, Iron molybdenum niobium tellurium vanadium oxide

146569-68-8P, Magnesium molybdenum niobium tellurium vanadium

oxide 146569-69-9P, Molybdenum nickel niobium tellurium vanadium

oxide 146569-70-2P, Manganese molybdenum niobium tellurium

vanadium oxide 149920-42-3P, Molybdenum niobium palladium

tellurium vanadium oxide 224324-44-1P, Molybdenum niobium

samarium tellurium vanadium oxide 224324-48-5P, Lanthanum

molybdenum niobium tellurium vanadium oxide 406675-48-7P,

Molybdenum niobium tellurium vanadium zinc oxide 406675-79-4P,

Molybdenum niobium tellurium vanadium bromide oxide 406675-80-7P

, Molybdenum niobium tellurium vanadium chloride oxide

406675-82-9P, Molybdenum niobium tellurium vanadium iodide oxide

406675-87-4P, Indium molybdenum niobium tellurium vanadium oxide

675571-72-9P, Lead molybdenum niobium tellurium vanadium oxide
 676365-84-7P 676365-85-8P 676365-86-9P
 676365-87-0P 676365-88-1P 676365-89-2P
 RL: CAT (Catalyst use); IMF (Industrial manufacture);
 PREP (Preparation); USES (Uses)
 (hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the
 selective oxidation of hydrocarbons)

IT 79-10-7P, Acrylic acid, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the
 selective oxidation of hydrocarbons)

IT 74-98-6, Propane, reactions 7446-07-3, Tellurium dioxide 7757-79-1,
 Potassium nitrate, reactions 7779-88-6, Zinc nitrate 7790-69-4,
 Lithium nitrate 10099-59-9, Lanthanum nitrate 10099-74-8, Lead (II)
 nitrate 10102-05-3, Palladium nitrate 10124-37-5, Calcium nitrate
 10139-58-9, Rhodium nitrate 10141-05-6, Cobalt(II) nitrate 10241-05-1,
 Molybdenum (V) chloride 10361-83-8, Samarium nitrate 10377-60-3,
 Magnesium nitrate 10377-66-9, Manganese(II) nitrate 10421-48-4,
 Iron(III) nitrate 12054-85-2 13138-45-9, Nickel(II) nitrate
 13446-57-6, Molybdenum (III) bromide 13548-38-4, Chromium trinitrate
 13770-61-1, Indium(III) nitrate 15513-94-7, Vanadium iodide (VI3)
 20634-12-2, Tetraamineplatinum(II) dinitrate 27774-13-6, Vanadyl sulfate
 168547-43-1
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the
 selective oxidation of hydrocarbons)

L37 ANSWER 4 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:267190 HCAPLUS
 DN 140:289191
 ED Entered STN: 01 Apr 2004
 TI Heterogeneously catalyzed gas-phase partial oxidation of acrolein to
 acrylic acid
 IN Dieterle, Martin; Borgmeier, Frieder; Mueller-Engel, Klaus Joachim; Hibst,
 Hartmut
 PA BASF Aktiengesellschaft, Germany
 SO U.S. Pat. Appl. Publ., 30 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 IC ICM B05D003-02
 ICS B32B027-04; B32B027-12; B32B005-02
 INCL 427372200; 442118000
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004062870	A1	20040401	US 2003-667786	20030923 <--
	DE 10245585	A1	20040408	DE 2002-10245585	20020927 <--
	DE 10246119	A1	20040415	DE 2002-10246119	20021001 <--
	DE 10248584	A1	20040429	DE 2002-10248584	20021017
	DE 10254278	A1	20040226	DE 2002-10254278	20021120
	DE 10254279	A1	20040603	DE 2002-10254279	20021120
	DE 10261186	A1	20040708	DE 2002-10261186	20021220
	EP 1546073	A1	20050629	EP 2003-769283	20030918 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	EP 1546074	A1	20050629	EP 2003-798911	20030918 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				

PRAI DE 2002-10245585	A	20020927	<--
DE 2002-10246119	A	20021001	<--
DE 2002-10248584	A	20021017	
DE 2002-10254278	A	20021120	
DE 2002-10254279	A	20021120	
DE 2002-10261186	A	20021220	
WO 2003-EP10374	W	20030918	
WO 2003-EP10375	W	20030918	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES	
US 2004062870	ICM	B05D003-02	
	ICS	B32B027-04; B32B027-12; B32B005-02	
	INCL	427372200; 442118000	
US 2004062870	NCL	427/372.200; 442/118.000	<--
DE 10254278	ECLA	C01G033/00D; C01G039/00D	
OS CASREACT 140:289191			
AB	A process for the heterogeneously catalyzed gas-phase partial oxidation of acrolein to acrylic acid over a multimetal oxide material having a specific structure, which contains the elements Mo and V, at least one of the elements Te and Sb and at least one of the elements from the group consisting of Nb, Ta, W and Ti and is doped with promoter elements, is described. The catalysts have a specified x-ray diffraction pattern.		
ST	acrolein oxidn acrylic acid multimetal catalyst; molybdenum vanadium oxide catalyst oxidn		
IT	Oxidation		
	Oxidation catalysts	(heterogeneously catalyzed gas-phase partial oxidation of acrolein to acrylic acid)	
IT	Oxides (inorganic), uses		
	RL: CAT (Catalyst use); USES (Uses)	(multimetal; heterogeneously catalyzed gas-phase partial oxidation of acrolein to acrylic acid)	
IT	146569-65-5P 146569-69-9P 149920-40-1P 149920-42-3P 675571-72-9P		
	RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)	(heterogeneously catalyzed gas-phase partial oxidation of acrolein to acrylic acid)	
IT	79-10-7P, Acrylic acid, preparation		
	RL: IMF (Industrial manufacture); PREP (Preparation)	(heterogeneously catalyzed gas-phase partial oxidation of acrolein to acrylic acid)	
IT	107-02-8, Acrolein, reactions 115-07-1, Propene, reactions		
	RL: RCT (Reactant); RACT (Reactant or reagent)	(heterogeneously catalyzed gas-phase partial oxidation of acrolein to acrylic acid)	

L37 ANSWER 5 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:238304 HCAPLUS
DN 138:238549
ED Entered STN: 27 Mar 2003
TI Process for producing acrylic acid
IN Yunoki, Hiromi
PA Nippon Shokubai Co., Ltd., Japan
SO Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM B01J023-16

ICS B01J023-68; B01J023-887; C07C051-25; C07C057-04

CC 35-2 (Chemistry of Synthetic High Polymers)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1295636	A2	20030326	EP 2002-20181	20020909 <--
	EP 1295636	A3	20030806		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
	JP 2003089671	A2	20030328	JP 2001-285033	20010919 <--
	US 2003125580	A1	20030703	US 2002-228089	20020827 <--
	TW 583022	B	20040411	TW 2002-91120800	20020910 <--
	BR 2002003782	A	20030603	BR 2002-3782	20020917 <--
	CN 1408700	A	20030409	CN 2002-142436	20020919 <--
	PRAI JP 2001-285033	A	20010919	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP	1295636	ICM	B01J023-16
		ICS	B01J023-68; B01J023-887; C07C051-25; C07C057-04
	1295636	ECLA	B01J023/00B; B01J023/887K; B01J035/00B
	2003125580	NCL	562/535.000
	ECLA	B01J023/00B; B01J023/887K; B01J035/00B; C07C051/25B+57/04	

AB The present invention provides a process for producing acrylic acid, by which process the problem, such that the catalyst placed on the gas inlet side deteriorates faster than that placed on the gas outlet side, is solved, so that the catalyst can be used stably for a long time. The process for producing acrylic acid, according to the present invention, comprises the step of carrying out catalytic gas phase oxidation with a fixed-bed shell-and-tube reactor as packed with a catalyst, wherein: used as the catalyst is an oxide shown by the following general formula (1): Mo_AV_BAc_CBdCeOf (1) (wherein: A shows at least one member selected from the group consisting of niobium and tungsten; B shows at least one member selected from the group consisting of chromium, manganese, iron, cobalt, nickel, copper, zinc, and bismuth; C shows at least one member selected from the group consisting of phosphorus, tin, antimony, and tellurium); and at least two reaction zones as provided by dividing the inside of each reaction tube in a direction of an axis of the tube in the reactor are packed with the catalyst such that there are regulated the kind and/or amount of the A component and/or the kind and/or amount of the B component.

ST acrylic acid prep mixed metal oxide carboxylation catalyst

IT Carboxylation catalysts

(process for producing acrylic acid)

IT 178468-18-3P, Antimony copper molybdenum tungsten vanadium oxide
182748-67-0P, Antimony copper molybdenum niobium tungsten vanadium oxide
292139-85-6P, Antimony copper molybdenum niobium vanadium oxide
501644-87-7P 501644-88-8P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(process for producing acrylic acid)

IT 79-10-7P, Acrylic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(process for producing acrylic acid)

IT 107-02-8, Acrolein, reactions 1309-64-4, Antimony trioxide, reactions 7757-79-1, Potassium nitrate, reactions 7803-55-6, Ammonium metavanadate 10031-43-3, Copper nitrate trihydrate 11098-84-3, Ammonium molybdate 11120-25-5, Ammonium paratungstate 37349-30-7, Niobic acid

RL: RCT (Reactant); RACT (Reactant or reagent)

(process for producing acrylic acid)

L37 ANSWER 6 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN
 AN 2003:76688 HCPLUS
 DN 138:122955
 ED Entered STN: 31 Jan 2003
 TI Catalyst for the selective oxidation and ammoxidation of alkanes and/or alkenes to (meth)acrylic acid or acrylonitrile
 IN Lopez Nieto, Jose Manuel; Botella, Asuncion Pablo; Solsona, Espriu Benjamin
 PA Consejo Superior De Investigaciones Cientificas, Spain; Universidad Politecnica De Valencia
 SO PCT Int. Appl., 38 pp.
 CODEN: PIXXD2
 DT Patent
 LA Spanish
 IC ICM B01J023-887
 ICS B01J027-057; C07C045-35; C07C051-215; C07C051-25; C07C057-04;
 C07C253-24; C07C255-08
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 45

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003008096	A1	20030130	WO 2002-ES357	20020716 <--
	W: CA, JP, US				
	RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
	ES 2181600	A1	20030216	ES 2001-1756	20010717 <--
	ES 2181600	B1	20040116		
	EP 1473081	A1	20041103	EP 2002-748887	20020716 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR, BG, CZ, EE, SK				
	JP 2004534650	T2	20041118	JP 2003-513694	20020716 <--
	US 2004230070	A1	20041118	US 2004-759384	20040116 <--
PRAI	ES 2001-1756	A	20010717	<--	
	WO 2002-ES357	W	20020716	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	WO 2003008096	ICM	B01J023-887
		ICS	B01J027-057; C07C045-35; C07C051-215; C07C051-25; C07C057-04; C07C253-24; C07C255-08
	WO 2003008096	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J023/887K; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24; C07C253/26
	EP 1473081	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J023/887K; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24; C07C253/26
	JP 2004534650	FTERM	4G069/AA02; 4G069/AA03; 4G069/AA08; 4G069/BA01A; 4G069/BA02A; 4G069/BA04A; 4G069/BB06A; 4G069/BB06B; 4G069/BB15A; 4G069/BC22A; 4G069/BC31A; 4G069/BC31B; 4G069/BC38A; 4G069/BC50A; 4G069/BC54A; 4G069/BC54B; 4G069/BC55A; 4G069/BC55B; 4G069/BC56A; 4G069/BC58A; 4G069/BC59A; 4G069/BC59B; 4G069/BC66A; 4G069/BC67A; 4G069/BC68A; 4G069/BD05A; 4G069/BD09A; 4G069/BD10A; 4G069/BD10B; 4G069/CB17; 4G069/CB54; 4G069/DA05; 4G069/EA02Y; 4G069/EC25; 4G069/FA01; 4G069/FA02; 4G069/FB05; 4G069/FB30; 4G069/FB31; 4G069/FC08; 4H006/AA02; 4H006/AC46; 4H006/AC54; 4H006/BA05; 4H006/BA12; 4H006/BA14; 4H006/BA15; 4H006/BA30;

4H006/BA82; 4H006/BA85; 4H006/BS10; 4H006/QN24;
 4H039/CA65; 4H039/CA70; 4H039/CC30; 4H039/CL50 <--

US 2004230070 NCL 558/323.000; 562/547.000
 ECLA B01J023/00B; B01J023/20; B01J023/28; B01J023/887K;
 B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04;
 C07C253/24; C07C253/26 <--

AB Catalysts for the selective oxidation and ammoxidn. of alkanes and/or alkenes to acrylic acid, acrylonitrile, or their derivs. comprise at least one oxide, preferably a calcined mixed oxide of Mo, Te, V, Cu and at least one other compound A which is selected from Nb, Ta, Sn, Se, W, Ti, Fe, Co, Ni, Cr, Ga, Sb, Bi, a rare earth, an alkaline or alkaline-earth metal. In the calcined form, the X-ray diffractogram of the catalyst comprises five intense diffraction lines, typically the most intense, corresponding to diffraction angles 2θ of 22.1 ± 0.4 ; 27.1 ± 0.4 ; 28.1 ± 0.4 ; 36 ± 0.4 y 45.1 ± 0.4 . According to a preferred production method, the catalyst has empirical formula: $\text{Mo}_h\text{Te}_i\text{V}_j\text{Cu}_k\text{A}_x\text{O}_x$, wherein h, i, j, and k denote values of between 0.001 and 4 and x is dependent on the oxidation state or the valency of elements Mo, Te, V, Cu and A.

ST mixed metal oxide catalyst acrylic acid prep; acrylonitrile prep mixed metal oxide catalyst

IT Ammoxidation catalysts
 Oxidation catalysts

(mixed metal oxide catalyst for the selective oxidation and ammoxidn. of alkanes and/or alkenes to (meth)acrylic acid or acrylonitrile)

IT Alkanes, reactions
 Alkenes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(mixed metal oxide catalyst for the selective oxidation and ammoxidn. of alkanes and/or alkenes to (meth)acrylic acid or acrylonitrile)

IT Oxides (inorganic), preparation

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(mixed; mixed metal oxide catalyst for the selective oxidation and ammoxidn. of alkanes and/or alkenes to (meth)acrylic acid or acrylonitrile)

IT 146569-47-3P, Molybdenum tellurium vanadium oxide 146569-48-4P, Molybdenum niobium tellurium vanadium oxide 406681-66-1P, Copper molybdenum niobium tellurium vanadium oxide 491596-18-0P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(mixed metal oxide catalyst for the selective oxidation and ammoxidn. of alkanes and/or alkenes to (meth)acrylic acid or acrylonitrile)

IT 79-10-7P, Acrylic acid, preparation 79-41-4P, Methacrylic acid, preparation 107-13-1P, Acrylonitrile, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(mixed metal oxide catalyst for the selective oxidation and ammoxidn. of alkanes and/or alkenes to (meth)acrylic acid or acrylonitrile)

IT 74-98-6, Propane, reactions 75-28-5, Isobutane 115-07-1, Propylene, reactions 115-11-7, Isobutylene, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(mixed metal oxide catalyst for the selective oxidation and ammoxidn. of alkanes and/or alkenes to (meth)acrylic acid or acrylonitrile)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Basf; ES 2061572 T 1994 HCPLUS
- (2) Mitsubishi Chemical Corp; EP 970942 A 2000 HCPLUS
- (3) Mitsubishi Chemical Corp; EP 997454 A 2000 HCPLUS
- (4) Rohm & Haas Co; EP 962253 A 1999 HCPLUS
- (5) The Standard Oil Co; EP 489506 A 1992 HCPLUS
- (6) The Standard Oil Company; EP 31693 A 1981 HCPLUS

L37 ANSWER 7 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:914786 HCAPLUS
 DN 137:389686
 ED Entered STN: 03 Dec 2002
 TI Production method of oxidation reaction catalyst for gas phase production of unsatd. nitriles and carboxylic acids
 IN Hinako, Hidenori; Watanabe, Mamoru
 PA Asahi Kasei Corporation, Japan
 SO Jpn. Kokai Tokkyo Koho, 9 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM B01J023-28
 ICS B01J023-88; B01J037-08; C01G049-00; C07C051-215; C07C057-05;
 C07C253-24; C07C255-08; C07B061-00
 CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 78

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002346384	A2	20021203	JP 2001-193166	20010626 <--
PRAI	JP 2001-83110	A	20010322	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	JP 2002346384	ICM	B01J023-28
		ICS	B01J023-88; B01J037-08; C01G049-00; C07C051-215; C07C057-05; C07C253-24; C07C255-08; C07B061-00

AB The invention refers to an oxidation reaction catalyst used to produce unsatd. nitriles and carboxylic acids from propane or isobutane ammoxidn. in the gas phase, wherein a stock mixture containing precursors of Mo, V, Sb, Te, and a complex oxide of the other elements in the catalyst is used to form the catalyst $Mo_1VaXbNb_2ZdOn$ [X = Sb and/or Te; Z = Bi, Ti, W, Cr, Al, Ta, Zr, Hf, Mn, Re, Fe, Ru, Rh, Ni, Pd, Pt, Cu, Ag, Zn, B, Ga, In, Ge, Sn, P, Pb, Y; $0.1 < a < 1$; $0.01 < b < 0.6$; $0.01 < c < 0.3$; $0 < d < 1$; n = dependent on the oxidation of the metals].

ST ammoxidn catalyst gas phase reaction complex oxide

IT Reaction
 (gas-phase; production method for oxidation reaction catalyst)

IT Ammoxidation
 Ammoxidation catalysts
 (production method for oxidation reaction catalyst)

IT Carboxylic acids, preparation
 Nitriles, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (unsatd.; production method for oxidation reaction catalyst)

IT 7631-86-9, Silica, uses
 RL: CAT (Catalyst use); USES (Uses)
 (production method for oxidation reaction catalyst)

IT 198018-04-1P 380413-70-7P
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP
 (Preparation); USES (Uses)
 (production method for oxidation reaction catalyst)

IT 74-98-6, Propane, reactions 1309-64-4, Antimony oxide, reactions
 1313-96-8, Niobium oxide 7664-41-7, Ammonia, reactions 7782-44-7,
 Oxygen, reactions 7803-55-6 148047-77-2, Antimony iron oxide ($SbFeO_3$)
 338746-13-7 380413-71-8, Aluminum antimony oxide (Al_2SbO_3) 380413-72-9,
 Aluminum antimony oxide ($Al_1.2SbO_3.3$)
 RL: RCT (Reactant); RACT (Reactant or reagent)

(production method for oxidation reaction catalyst)

L37 ANSWER 8 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:847496 HCAPLUS
 DN 137:338387
 ED Entered STN: 08 Nov 2002
 TI Annealed and promoted catalyst for the production of unsatd. carboxylic acids and nitriles
 IN Gaffney, Anne Mae; Heffner, Michele Doreen; Song, Ruozhi
 PA Rohm and Haas Company, USA
 SO Eur. Pat. Appl., 18 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM B01J023-00
 ICS B01J023-10; B01J023-20; B01J023-28; C07C253-24; C07C051-215
 CC 35-2 (Chemistry of Synthetic High Polymers)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1254706	A2	20021106	EP 2002-252860	20020423 <--
	EP 1254706	A3	20030402		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	US 2002183198	A1	20021205	US 2002-117904	20020408 <--
	US 6645905	B2	20031111		
	TW 575542	B	20040211	TW 2002-91107761	20020416 <--
	BR 2002001364	A	20030610	BR 2002-1364	20020422 <--
	CN 1383916	A	20021211	CN 2002-118440	20020425 <--
	JP 2003038960	A2	20030212	JP 2002-123833	20020425 <--
	US 2004029725	A1	20040212	US 2003-636113	20030807 <--
PRAI	US 2001-286278P	P	20010425	<--	
	US 2002-117904	A3	20020408	<--	

CLASS	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1254706	ICM	B01J023-00	
	ICS	B01J023-10; B01J023-20; B01J023-28; C07C253-24; C07C051-215	
EP 1254706	ECLA	B01J023/00B; B01J023/10; B01J023/22; B01J023/28; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24	<--
US 2002183198	NCL	502/311.000; 502/312.000; 558/323.000	
	ECLA	C07C051/215+57/04; C07C051/25B+57/04; C07C253/24	<--
US 2004029725	NCL	502/208.000; 502/302.000; 502/309.000; 502/310.000; 502/306.000; 502/311.000; 502/209.000; 502/210.000; 502/211.000; 502/212.000	
	ECLA	B01J023/00B; B01J023/10; B01J023/22; B01J023/28; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24	<--

AB A mixed metal oxide, which may be an orthorhombic phase material, is improved as a catalyst for the production of unsatd. carboxylic acids, or unsatd. nitriles, from alkanes, or mixts. of alkanes and alkenes, by: contacting with a liquid contact member selected from the group consisting of organic acids, alcs., inorg. acids, and hydrogen peroxide to form a contact mixture; recovering insol. material from the contact mixture; calcining the recovered insol. material in a non-oxidizing atmospheric; and mixing the calcined recovered insol. material with (i) at least one promoter element or compound thereof and (ii) at least one solvent for the at least one promoter element or compound thereof; removing the at least one

solvent to form a catalyst precursor; and calcining the catalyst precursor.
 ST samarium contg metal oxide carboxylation catalyst acrylic acid prepn
 IT Carboxylation catalysts
 (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT Oxides (inorganic), uses
 RL: CAT (Catalyst use); USES (Uses)
 (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT Nitriles, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT Alcohols, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT Alkanes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT Alkenes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT Acids, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (inorg.; annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT Acids, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (organic; annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT Carboxylic acids, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (unsatd.; annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT 224324-44-1P, Molybdenum niobium samarium tellurium vanadium oxide
 RL: CAT (Catalyst use); IMF (Industrial manufacture);
 PREP (Preparation); USES (Uses)
 (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT 79-10-7P, Acrylic acid, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT 74-98-6, Propane, reactions 7664-41-7, Ammonia, reactions 7722-84-1,
 Hydrogen peroxide, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)
 IT 144-62-7, Oxalic acid, reactions 7440-19-9, Samarium, reactions
 7697-37-2, Nitric acid, reactions 7803-55-6, Ammonium metavanadate
 11120-48-2, Telluric acid 12054-85-2 21348-59-4, Niobium oxalate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (catalyst preparation reactant; annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)

L37 ANSWER 9 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:504687 HCAPLUS
 DN 137:79353
 ED Entered STN: 05 Jul 2002
 TI Alkane oxidation catalysts, process for producing them, and process for producing oxygen-containing unsaturated compounds
 IN Kobayashi, Tomoaki; Seo, Yoshimasa
 PA Nippon Kayaku Kabushiki Kaisha, Japan
 SO PCT Int. Appl., 24 pp.
 CODEN: PIXXD2
 DT Patent
 LA Japanese
 IC ICM B01J023-28
 ICS B01J023-30; B01J027-057; C07C045-35; C07C047-22; C07C051-215;
 C07C057-05
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 67
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002051542	A1	20020704	WO 2001-JP11180	20011220 <--
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	JP 2002361085	A2	20021217	JP 2001-384086	20011218 <--
	EP 1346766	A1	20030924	EP 2001-272266	20011220 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	TW 583023	B	20040411	TW 2001-90131616	20011220 <--
	BR 2001016366	A	20040706	BR 2001-16366	20011220 <--
	ZA 2003004713	A	20041018	ZA 2003-4713	20011220 <--
	US 2004054221	A1	20040318	US 2003-450373	20030610 <--
PRAI	JP 2000-391078	A	20001222	<--	
	JP 2001-94513	A	20010329	<--	
	JP 2001-108122	A	20010406	<--	
	WO 2001-JP11180	W	20011220	<--	

CLASS	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2002051542	ICM	B01J023-28	
	ICS	B01J023-30; B01J027-057; C07C045-35; C07C047-22; C07C051-215; C07C057-05	
WO 2002051542	ECLA	B01J023/00B; B01J023/18; B01J023/22; B01J023/28; B01J027/057T; B01J037/08; B01J037/10; C07C045/33; C07C045/33+47/22; C07C051/215+57/04	<--
EP 1346766	ECLA	B01J023/00B; B01J023/18; B01J023/22; B01J023/28; B01J027/057T; B01J037/08; B01J037/10; C07C045/33; C07C051/215+57/04	<--
US 2004054221	NCL	562/547.000; 502/309.000	
	ECLA	B01J023/00B; B01J023/22; B01J023/28; B01J027/057T; B01J037/08; B01J037/10; C07C045/33; C07C045/33+47/22; C07C051/215+57/04; B01J023/18	<--

AB High-activity catalysts Mo₁.0VaTibXcYdOe or Mo₁.0VaTibXcYdZfOe (X = Sb,

Te; Y = Nb, W, Zr; Z = Li, Na, K, Rb, Cs, Mg, Ca, Sr; a, b, c, d, e, f = atomic proportions of the resp. elements; $0 < a < 0.7$; $0 < b < 0.3$; $0 < c < 0.7$; $0 \leq d < 0.3$; $0 < f < 0.1$; e = number determined by the oxidized states of the other elements) are prepared and used for oxidation of alkanes. The catalysts are especially suitable for use in the production of (meth)acrolein

or

(meth)acrylic acid from propane through vapor-phase catalytic oxidation
ST propane vapor phase oxidn catalyst acrylic acid prepn; molybdenum vanadium titanium antimony tellurium oxide oxidn catalyst alkane

IT Oxidation catalysts

(gas-phase; high-activity oxidation catalysts for alkanes for preparation of (meth)acrolein or (meth)acrylic acid)

IT Alkanes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(high-activity oxidation catalysts for alkanes for preparation of oxygen-containing unsatd. compds.)

IT 107-02-8P, Acrolein, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(high-activity oxidation catalysts for propane for preparation of acrolein)

IT 202523-10-2P 380413-67-2P 380413-74-1P 439936-04-6P

439936-05-7P 439936-06-8P 439936-07-9P 439936-08-0P 439936-09-1P

439936-10-4P 439936-11-5P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(high-activity oxidation catalysts for propane for preparation of acrylic acid)

IT 79-10-7P, Acrylic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(high-activity oxidation catalysts for propane for preparation of acrylic acid)

IT 74-98-6, Propane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(high-activity oxidation catalysts for propane for preparation of acrylic acid)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Mitsubishi Chemical Corp; JP 1017523 A 1998
- (2) Mitsubishi Chemical Corp; JP 10195036 A 1998 HCPLUS
- (3) Mitsubishi Rayon Co Ltd; JP 200288012 A 2002
- (4) Mitsubishi Rayon Co Ltd; JP 200288013 A 2002
- (5) Nippon Shokubai Co Ltd; JP 08206504 A 1996 HCPLUS
- (6) Nippon Shokubai Co Ltd; US 5739392 A 1996 HCPLUS
- (7) Nippon Shokubai Co Ltd; EP 711745 A1 1996 HCPLUS

L37 ANSWER 10 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2002:252973 HCPLUS

DN 136:279834

ED Entered STN: 05 Apr 2002

TI Promoted multi-metal oxide oxidation or ammoxidation catalysts

IN Chaturvedi, Sanjay; Gaffney, Anne Mae; Han, Scott; Heffner, Michele Doreen; Song, Ruozhi

PA Rohm and Haas Company, USA

SO Eur. Pat. Appl., 20 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM B01J023-28

ICS B01J023-00; C07C253-24; C07C051-215; B01J027-057

CC 35-2 (Chemistry of Synthetic High Polymers)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1192988 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO	A1	20020403	EP 2001-308129	20010925 <--
	US 2002062042	A1	20020523	US 2001-928030	20010811 <--
	US 6407031	B2	20020618		
	CN 1346700	A	20020501	CN 2001-140940	20010927 <--
	BR 2001004322	A	20020507	BR 2001-4322	20010927 <--
	JP 2002159855	A2	20020604	JP 2001-297319	20010927 <--
	US 2002143208	A1	20021003	US 2002-95612	20020312 <--
	US 6825380	B2	20041130		
PRAI	US 2000-235982P US 2000-235983P US 2000-236073P US 2000-236250P US 2000-236305P US 2001-928030	P	20000928	<--	
		P	20000928	<--	
		P	20000928	<--	
		P	20000928	<--	
		P	20000928	<--	
		A	20010811	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	EP 1192988	ICM	B01J023-28
		ICS	B01J023-00; C07C253-24; C07C051-215; B01J027-057
	EP 1192988	ECLA	B01J023/22; B01J023/28; B01J027/057T; C07C253/24 <--
	US 2002062042	NCL	502/311.000; 502/309.000; 502/312.000; 502/322.000; 556/042.000; 556/047.000
		ECLA	B01J023/22; B01J023/28; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24 <--
	US 2002143208	NCL	562/542.000; 502/215.000; 502/302.000; 502/304.000; 502/309.000; 502/311.000; 502/312.000; 558/303.000; 558/318.000; 558/319.000; 558/320.000; 562/544.000; 562/549.000
		ECLA	B01J023/22; B01J023/28; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24 <--

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsatd. carboxylic acid and for the vapor phase ammoxidn. of an alkane or a mixture of an alkane and an alkene to an unsatd. nitrile. The catalyst comprises ≥1 element selected from the group consisting of Sc, Y, Pr, Nd and Tb. Thus, ammonium heptamolybdate tetrahydrate 12.93, ammonium metavanadate 2.55, telluric acid 3.87, and praseodymium nitrate 1.26 g were dissolved in water 70°, 61.92 g aqueous niobium oxalate containing 1.36% Nb in 1.43 g of oxalic acid was added was added at 40°, water was removed at 50° and 28 mm Hg to obtain 23 g of a precursor solid which was calcined in a quartz tube. to give a catalyst with nominal composition Mo_{1.0}V_{0.3}Te_{0.23}Nb_{0.08}Pr_{0.04}O_x, which was used as an oxidation catalyst

of propane to produce acrylic acid.

ST metal oxide oxidn ammoxidn catalyst nitrile carboxylic acid prep

IT Ammoxidation catalysts

Oxidation catalysts

(promoted multi-metal oxide catalysts for oxidation or ammoxidn. of alkanes and/or alkenes to carboxylic acids or nitriles)

IT Alkanes, reactions

Alkenes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(promoted multi-metal oxide catalysts for oxidation or ammoxidn. of alkanes and/or alkenes to carboxylic acids or nitriles)

IT Carboxylic acids, preparation

Nitriles, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)
 (unsatd.; promoted multi-metal oxide catalysts for oxidation or ammoxidn.
 of alkanes and/or alkenes to carboxylic acids or nitriles)

IT 144-62-7, Oxalic acid, uses 7440-27-9, Terbium, uses 7803-55-6
 10361-80-5, Praseodymium nitrate 11120-48-2, Telluric acid 12054-85-2
 13465-60-6, Scandium nitrate 13494-98-9, Yttrium nitrate hexahydrate
 16454-60-7 21348-59-4, Niobium oxalate

RL: CAT (Catalyst use); USES (Uses)
 (promoted multi-metal oxide catalysts for oxidation or ammoxidn. of
 alkanes and/or alkenes to carboxylic acids or nitriles)

IT 224324-37-2P, Molybdenum neodymium niobium tellurium vanadium
 oxide 224324-51-0P, Molybdenum niobium praseodymium tellurium
 vanadium oxide 224324-60-1P, Molybdenum niobium tellurium
 terbium vanadium oxide 224324-73-6P, Molybdenum niobium scandium
 tellurium vanadium oxide 406675-58-9P

RL: CAT (Catalyst use); IMF (Industrial manufacture);
 PREP (Preparation); USES (Uses)
 (promoted multi-metal oxide catalysts for oxidation or ammoxidn. of
 alkanes and/or alkenes to carboxylic acids or nitriles)

IT 79-10-7P, Acrylic acid, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (promoted multi-metal oxide catalysts for oxidation or ammoxidn. of
 alkanes and/or alkenes to carboxylic acids or nitriles)

IT 74-98-6, Propane, reactions 7664-41-7, Ammonia, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (promoted multi-metal oxide catalysts for oxidation or ammoxidn. of
 alkanes and/or alkenes to carboxylic acids or nitriles)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Asahi Chemical Ind; DE 19847656 A 1999 HCPLUS
- (2) Mitsubishi Chem Corp; EP 0970942 A 2000 HCPLUS
- (3) Rohm & Haas; EP 0962253 A 1999 HCPLUS

L37 ANSWER 11 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2002:252972 HCPLUS

DN 136:279833

ED Entered STN: 05 Apr 2002

TI Promoted multi-metal oxide oxidation or ammoxidation catalysts

IN Chaturvedi, Sanjay; Gaffney, Anne Mae; Han, Scott; Le, Hung Nhu
 Dominique; Song, Ruozhi; Heffner, Michele Doreen; Vickery, Elsie
 Mae

PA Rohm and Haas Company, USA

SO Eur. Pat. Appl., 24 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM B01J023-00

ICS B01J023-28; B01J027-057; C07C253-24; C07C051-215

CC 35-2 (Chemistry of Synthetic High Polymers)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1192987	A1	20020403	EP 2001-308131	20010925 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 2002065431	A1	20020530	US 2001-928197	20010810 <--
	US 6407280	B1	20020618		
	BR 2001004285	A	20020507	BR 2001-4285	20010927 <--
	CN 1347756	A	20020508	CN 2001-140941	20010927 <--

JP 2002177784	A2	20020625	JP 2001-300840	20010928 <--
US 6504053	B1	20030107	US 2002-144924	20020514 <--
PRAI US 2000-235979P	P	20000928	<--	
US 2000-235984P	P	20000928	<--	
US 2000-236000P	P	20000928	<--	
US 2000-236130P	P	20000928	<--	
US 2001-286219P	P	20010425	<--	
US 2001-928197	A	20010810	<--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1192987	ICM	B01J023-00
	ICS	B01J023-28; B01J027-057; C07C253-24; C07C051-215
EP 1192987	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J023/652D; B01J023/68M4; B01J023/887K; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24 <--
US 2002065431	NCL	558/319.000; 502/309.000; 502/310.000; 502/311.000; 502/344.000; 558/318.000
	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J023/652D; B01J023/68M4; B01J023/887K; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24 <--
US 6504053	NCL	562/549.000; 502/309.000; 502/310.000; 562/547.000
	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J023/652D; B01J023/68M4; B01J023/887K; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24 <--

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsatd. carboxylic acid and for the vapor phase ammoxidn. of an alkane or a mixture of an alkane and an alkene to an unsatd. nitrile. The multi-metal oxide catalyst comprises at least one element selected from the group consisting of Ni, Pd, Cu, Ag and Au.

ST metal oxide oxidn ammoxidn catalyst carboxylic acid prepn

IT Ammoxidation catalysts

Oxidation catalysts

(promoted multi-metal oxide oxidation or ammoxidn. catalysts for preparation of

carboxylic acids or nitriles from alkanes and/or alkenes)

IT Alkanes, reactions

Alkenes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(promoted multi-metal oxide oxidation or ammoxidn. catalysts for preparation of

carboxylic acids or nitriles from alkanes and/or alkenes)

IT Carboxylic acids, preparation

Nitriles, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(unsatd.; promoted multi-metal oxide oxidation or ammoxidn. catalysts for preparation of carboxylic acids or nitriles from alkanes and/or alkenes)

IT 144-62-7, Oxalic acid, uses 7761-88-8, Silver nitrate, uses 7803-55-6,

Ammonium metavanadate 10102-05-3, Palladium nitrate 11120-48-2,

Telluric acid 12054-85-2 13478-00-7, Nickel nitrate hexahydrate

21348-59-4, Niobium oxalate 31113-23-2 33971-89-0

RL: CAT (Catalyst use); USES (Uses)

(promoted multi-metal oxide oxidation or ammoxidn. catalysts for preparation of

carboxylic acids or nitriles from alkanes and/or alkenes)

IT 146569-48-4P, Molybdenum niobium tellurium vanadium oxide

146569-69-9P, Molybdenum nickel niobium tellurium vanadium oxide

149920-42-3P, Molybdenum niobium palladium tellurium vanadium

oxide 406681-66-1P 406681-67-2P 406681-68-3P

RL: CAT (Catalyst use); IMF (Industrial manufacture);
PREP (Preparation); USES (Uses)

(promoted multi-metal oxide oxidation or ammoxidn. catalysts for preparation of

carboxylic acids or nitriles from alkanes and/or alkenes)

IT 79-10-7P, Acrylic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(promoted multi-metal oxide oxidation or ammoxidn. catalysts for preparation of

carboxylic acids or nitriles from alkanes and/or alkenes)

IT 74-98-6, Propane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(promoted multi-metal oxide oxidation or ammoxidn. catalysts for preparation of

carboxylic acids or nitriles from alkanes and/or alkenes)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Komada, S; US 6063728 A 2000 HCPLUS

(2) Mitsubishi Chem Corp; EP 0767164 A 1997 HCPLUS

(3) Mitsubishi Chem Corp; EP 0970942 A 2000 HCPLUS

(4) Nitto Chemical Industry Co Ltd; EP 0404529 A 1990 HCPLUS

(5) Umezawa, T; US 5231214 A 1993 HCPLUS

L37 ANSWER 12 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2002:252971 HCPLUS

DN 136:279832

ED Entered STN: 05 Apr 2002

TI Iridium and/or samarium promoted multi-metal oxide oxidation and
ammoxidation catalysts

IN Chaturvedi, Sanjay; Gaffney, Anne Mae; Han, Scott; Heffner,
Michele Doreen; Song, Ruozhi

PA Rohm and Haas Company, USA

SO Eur. Pat. Appl., 18 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM B01J023-00

ICS B01J023-28; B01J023-46; B01J027-057; C07C253-24; C07C051-215

CC 35-2 (Chemistry of Synthetic High Polymers)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1192986	A1	20020403	EP 2001-308128	20010925 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 2002062038	A1	20020523	US 2001-927288	20010810 <--
	US 6734136	B2	20040511		
	CN 1346701	A	20020501	CN 2001-140943	20010927 <--
	BR 2001004337	A	20020611	BR 2001-4337	20010927 <--
	TW 592801	B	20040621	TW 2001-90123902	20010927 <--
	JP 2002159858	A2	20020604	JP 2001-299122	20010928 <--
	US 2003204111	A1	20031030	US 2003-430599	20030507 <--
	US 6790988	B2	20040914		
PRAI	US 2000-235980P	P	20000928	<--	
	US 2000-235981P	P	20000928	<--	
	US 2000-236143P	P	20000929	<--	
	US 2001-927288	A	20010810	<--	

CLASS

PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES

EP 1192986	ICM	B01J023-00	
	ICS	B01J023-28; B01J023-46; B01J027-057; C07C253-24;	
		C07C051-215	
EP 1192986	ECLA	B01J023/00B; B01J023/652D; B01J027/057T;	<--
		C07C051/215+57/04; C07C051/25B+57/04; C07C253/24;	
		B01J023/10; B01J023/20; B01J023/28	
US 2002062038	NCL	502/215.000; 502/304.000; 502/312.000; 562/542.000	
	ECLA	B01J023/00B; B01J023/10; B01J023/20; B01J023/28;	
		B01J023/652D; B01J027/057T; C07C051/215+57/04;	
		C07C051/25B+57/04; C07C253/24	<--
US 2003204111	NCL	562/542.000; 502/215.000; 502/302.000; 502/304.000;	
		502/312.000; 562/547.000	
	ECLA	B01J023/00B; B01J023/10; B01J023/20; B01J023/28;	
		B01J023/652D; B01J027/057T; C07C051/215+57/04;	
		C07C051/25B+57/04; C07C253/24	<--
AB	A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsatd. carboxylic acid and for the vapor phase ammoxidn. of an alkane or a mixture of an alkane and an alkene to an unsatd. nitrile. The multi-metal catalyst contains Ir and/or Sm. Thus, ammonium heptamolybdate tetrahydrate (1.0 M Mo), ammonium metavanadate (0.3 M V), and telluric acid (0.23 Te), were agitated in water at 70°, niobium oxalate (0.25 M Nb), oxalic acid (0.31 M), and iridium in 5% nitric acid (10,000 µg/mL) were added to give Ir0.005Mo1V0.3Te0.23Nb0.1250x.		
ST	iridium samarium oxide oxidn ammoxidn catalyst acrylic acid prep		
IT	Ammoxidation catalysts		
	Oxidation catalysts		
	(iridium and/or samarium promoted multi-metal oxide oxidation and ammoxidn. catalysts)		
IT	Alkanes, reactions		
	Alkenes, reactions		
	RL: RCT (Reactant); RACT (Reactant or reagent)		
	(iridium and/or samarium promoted multi-metal oxide oxidation and ammoxidn. catalysts)		
IT	Carboxylic acids, preparation		
	Nitriles, preparation		
	RL: IMF (Industrial manufacture); PREP (Preparation)		
	(unsatd.; iridium and/or samarium promoted multi-metal oxide oxidation and ammoxidn. catalysts)		
IT	144-62-7, Oxalic acid, uses 7439-88-5, Iridium, uses 7440-19-9, Samarium, uses 7647-01-0, Hydrochloric acid, uses 7697-37-2, Nitric acid, uses 7803-55-6 11120-48-2, Telluric acid 12054-85-2 21348-59-4, Niobium oxalate		
	RL: CAT (Catalyst use); USES (Uses)		
	(iridium and/or samarium promoted multi-metal oxide oxidation and ammoxidn. catalysts)		
IT	224324-44-1P, Molybdenum niobium samarium tellurium vanadium oxide 406675-66-9P 406675-67-0P		
	RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)		
	(iridium and/or samarium promoted multi-metal oxide oxidation and ammoxidn. catalysts)		
IT	79-10-7P, Acrylic acid, preparation		
	RL: IMF (Industrial manufacture); PREP (Preparation)		
	(iridium and/or samarium promoted multi-metal oxide oxidation and ammoxidn. catalysts)		
IT	74-98-6, Propane, reactions 7664-41-7, Ammonia, reactions		
	RL: RCT (Reactant); RACT (Reactant or reagent)		
	(iridium and/or samarium promoted multi-metal oxide oxidation and ammoxidn. catalysts)		

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Asahi Chemical Ind; DE 19847656 A 1999 HCPLUS
- (2) Cassidy, T; US 6043185 A 2000 HCPLUS
- (3) Nitto Chemical Industry Co; EP 0475351 A 1992 HCPLUS
- (4) Rohm & Haas; EP 0962253 A 1999 HCPLUS

L37 ANSWER 13 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:252970 HCPLUS
 DN 136:279831
 ED Entered STN: 05 Apr 2002
 TI Halogen promoted multi-metal oxide oxidation and ammoxidation catalysts
 IN Chaturvedi, Sanjay; Gaffney, Anne Mae; Han, Scott; Heffner,
 Michele Doreen; Song, Ruozhi
 PA Rohm and Haas Company, USA
 SO Eur. Pat. Appl., 19 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM B01J023-00
 ICS B01J023-28; B01J027-057; B01J027-132; C07C253-24; C07C051-215
 CC 35-2 (Chemistry of Synthetic High Polymers)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1192984	A1	20020403	EP 2001-308121	20010925 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 2002058835	A1	20020516	US 2001-927941	20010810 <--
	US 6461996	B2	20021008		
	CN 1346699	A	20020501	CN 2001-140930	20010927 <--
	BR 2001004319	A	20020604	BR 2001-4319	20010927 <--
	TW 574070	B	20040201	TW 2001-90123927	20010927 <--
	JP 2003053190	A2	20030225	JP 2001-315888	20011012 <--
	US 2003018208	A1	20030123	US 2002-225709	20020822 <--
	US 6624111	B2	20030923		
	US 2003176734	A1	20030918	US 2003-444599	20030522 <--
	US 6747168	B2	20040608		
PRAI	US 2000-235977P	P	20000928	<--	
	US 2000-236261P	P	20000928	<--	
	US 2000-236262P	P	20000928	<--	
	US 2000-236263P	P	20000928	<--	
	US 2001-927041	A	20010810	<--	
	US 2001-927941	A	20010810	<--	
	US 2002-225709	A3	20020822	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1192984	ICM	B01J023-00	
	ICS	B01J023-28; B01J027-057; B01J027-132; C07C253-24; C07C051-215	
EP 1192984	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J027/057T; B01J027/132; C07C051/215; C07C051/25; C07C253/24	<--
US 2002058835	NCL	502/312.000	
	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J027/057T; B01J027/132; C07C051/215; C07C051/25; C07C253/24	<--
US 2003018208	NCL	502/312.000; 502/311.000; 562/549.000	
	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J027/057T; B01J027/132; C07C051/215; C07C051/25; C07C253/24	<--
US 2003176734	NCL	558/319.000	

ECLA B01J023/00B; B01J023/20; B01J023/28; B01J027/057T;
 B01J027/132; C07C051/215; C07C051/25; C07C253/24 <--

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsatd. carboxylic acid and for the vapor phase ammoxidn. of an alkane or a mixture of an alkane and an alkene to an unsatd. nitrile. The catalyst comprises an element selected from the group consisting of Br, Cl, F and I. Thus, ammonium heptamolybdate tetrahydrate (1.0 M Mo), ammonium metavanadate (0.3 M V), and telluric acid (0.23 Te) were dissolved in water at 70°, aqueous niobium oxalate (0.25 M Nb), oxalic acid (0.31 M), and aqueous molybdenum(III) bromide (0.033 M) were added to give a catalyst having a nominal composition of Br0.01Mo1V0.3Te0.23Nb0.125 Ox.

ST halogen metal oxide oxidn ammoxidn catalyst acrylic acid prepn

IT Ammoxidation catalysts

Oxidation catalysts

(halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

IT Alkanes, reactions

Alkenes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

IT Carboxylic acids, preparation

Nitriles, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(unsatd.; halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

IT 144-62-7, Oxalic acid, uses 7803-55-6 10049-12-4, Vanadium trifluoride 10241-05-1, Molybdenum(V) chloride 11120-48-2, Telluric acid 12054-85-2 13446-57-6, Molybdenum(III) bromide 15513-94-7, Vanadium triiodide 21348-59-4, Niobium oxalate

RL: CAT (Catalyst use); USES (Uses)

(halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

IT 406675-79-4P 406675-80-7P 406675-81-8P

406675-82-9P

RL: CAT (Catalyst use); IMF (Industrial manufacture);

PREP (Preparation); USES (Uses)

(halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

IT 79-10-7P, Acrylic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

IT 74-98-6, Propane, reactions 7664-41-7, Ammonia, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Mitsubishi Rayon Co; EP 0267556 A 1988 HCPLUS

(2) Standard Oil Co; GB 1578280 A 1980 HCPLUS

L37 ANSWER 14 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2002:252969 HCPLUS

DN 136:279830

ED Entered STN: 05 Apr 2002

TI Indium promoted multi-metal oxide oxidation and ammoxidation catalyst

IN Chaturvedi, Sanjay; Gaffney, Anne Mae; Han, Scott; Vickery, Elsie Mae

PA Rohm and Haas Company, USA

SO Eur. Pat. Appl., 19 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM B01J023-00

ICS B01J023-28; B01J027-057; B01J023-36; B01J023-62; C07C253-24;
C07C051-215

CC 35-2 (Chemistry of Synthetic High Polymers)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1192983	A1	20020403	EP 2001-308115	20010925 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 2002058836	A1	20020516	US 2001-928020	20010810 <--
	US 6403525	B2	20020611		
	CN 1346702	A	20020501	CN 2001-140929	20010927 <--
	BR 2001004323	A	20020604	BR 2001-4323	20010927 <--
	TW 224026	B1	20041121	TW 2001-90123929	20010927 <--
	JP 2002316053	A2	20021029	JP 2001-315793	20011012 <--
	US 2002133044	A1	20020919	US 2002-95633	20020312 <--
	US 6797840	B2	20040928		
PRAI	US 2000-236112P	P	20000928	<--	
	US 2001-283245P	P	20010412	<--	
	US 2001-928020	A	20010810	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	EP 1192983	ICM	B01J023-00
		ICS	B01J023-28; B01J027-057; B01J023-36; B01J023-62; C07C253-24; C07C051-215
	EP 1192983	ECLA	B01J023/00B; B01J023/08; B01J023/28; B01J023/36; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24
	US 2002058836	NCL	502/311.000; 502/309.000; 502/310.000; 502/312.000; 556/042.000; 556/047.000
		ECLA	B01J023/00B; B01J023/08; B01J023/28; B01J023/36; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24
	US 2002133044	NCL	562/542.000; 502/215.000; 502/304.000; 502/312.000
		ECLA	B01J023/00B; B01J023/08; B01J023/28; B01J023/36; B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04; C07C253/24

AB A catalyst comprising an indium promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, to an unsatd. carboxylic acid and for the vapor phase ammonoxidn. of an alkane, or a mixture of an alkane and an alkene, to an unsatd. nitrile. Thus, ammonium heptamolybdate tetrahydrate 34.00, ammonium metavanadate 6.69, telluric acid 10.07, and In(NO₃)₃-5H₂O 0.75 g were dissolved in water at 80° 155.93 g aqueous niobium oxalate was added at 20° to give a catalyst of nominal composition Mo1.0V0.3Te0.23Nb0.08In0.001 Ox.

ST indium metal oxidn ammonoxidn nitrile catalyst carboxylic acid prepn;
rhenium mixed metal oxide oxidn catalyst acrylic acid prepn

IT Ammonoxidation catalysts

Oxidation catalysts
(promoted multi-metal oxide oxidation catalyst)

IT Alkanes, reactions

Alkenes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(promoted multi-metal oxide oxidation catalyst)

IT Carboxylic acids, preparation

Nitriles, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(unsatd.; promoted multi-metal oxide oxidation catalyst)

IT 7803-55-6 11120-48-2, Telluric acid 12054-85-2 13598-65-7, Ammonium

perrhenate 13770-61-1, Indium trinitrate 21348-59-4, Niobium oxalate
 RL: CAT (Catalyst use); USES (Uses)
 (promoted multi-metal oxide oxidation catalyst)

IT 406675-87-4P 406675-88-5P
 RL: CAT (Catalyst use); IMF (Industrial manufacture);
 PREP (Preparation); USES (Uses)
 (promoted multi-metal oxide oxidation catalyst)

IT 79-10-7P, Acrylic acid, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (promoted multi-metal oxide oxidation catalyst)

IT 74-98-6, Propane, reactions 7664-41-7, Ammonia, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (promoted multi-metal oxide oxidation catalyst)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Komada, S; US 5907052 A 1999 HCAPLUS
- (2) Komada, S; US 6063728 A 2000 HCAPLUS
- (3) Mitsubishi Chem Ind; EP 0512846 A 1992 HCAPLUS
- (4) Rohm & Haas; EP 0962253 A 1999 HCAPLUS

L37 ANSWER 15 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:252968 HCAPLUS

DN 136:279829

ED Entered STN: 05 Apr 2002

TI Zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidation catalyst

IN Chaturvedi, Sanjay; Gaffney, Anne Mae; Han, Scott; Le, Hung Nhu Dominique

PA Rohm and Haas Company, USA

SO Eur. Pat. Appl., 22 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM B01J023-00

ICS B01J023-28; B01J027-057; B01J023-06; B01J023-08; C07C253-24; C07C051-215

CC 35-2 (Chemistry of Synthetic High Polymers)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1192982	A1	20020403	EP 2001-308114	20010925 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 2002072629	A1	20020613	US 2001-928019	20010810 <--
	US 6589907	B2	20030708		
	CN 1347755	A	20020508	CN 2001-140931	20010927 <--
	BR 2001004321	A	20020604	BR 2001-4321	20010927 <--
	JP 2002159857	A2	20020604	JP 2001-297738	20010927 <--
	TW 592808	B	20040621	TW 2001-90123930	20010927 <--
	US 2003191336	A1	20031009	US 2003-430194	20030506 <--
	US 6700015	B2	20040302		
PRAI	US 2000-235978P	P	20000928	<--	
	US 2000-236129P	P	20000928	<--	
	US 2000-236260P	P	20000928	<--	
	US 2001-928019	A	20010810	<--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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EP 1192982	ICM	B01J023-00
	ICS	B01J023-28; B01J027-057; B01J023-06; B01J023-08;

EP 1192982 ECLA C07C253-24; C07C051-215
 B01J023/00B; B01J023/06; B01J023/08; B01J023/28;
 B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04;
 C07C253/24 ---
 US 2002072629 NCL 502/311.000; 558/318.000; 558/319.000
 ECLA B01J023/00B; B01J023/06; B01J023/08; B01J023/28;
 B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04;
 C07C253/24 ---
 US 2003191336 NCL 562/512.200; 502/311.000
 ECLA B01J023/00B; B01J023/06; B01J023/08; B01J023/28;
 B01J027/057T; C07C051/215+57/04; C07C051/25B+57/04;
 C07C253/24 ---
 AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsatd. carboxylic acid and for the vapor phase ammoxidn. of an alkane or a mixture of an alkane and an alkene to an unsatd. nitrile. The mixed metal oxide comprises zinc and/or gallium. Thus, ammonium heptamolybdate tetrahydrate 13.06, ammonium metavanadate 2.60, telluric acid 3.91, and zinc nitrate hexahydrate 1.32 g were dissolved in 100 g water at 80°, 59.11 g aqueous niobium oxalate containing 0.93 % Nb was mixed at 20° to give a catalyst of nominal composition
 Mo1.0V0.03Te0.23Nb0.08Zn0.06Ox.
 ST zinc gallium oxide oxidn ammoxidn catalyst carboxylic acid prepn
 IT Carboxylic acids, preparation
 Nitriles, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (unsatd.; zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidn. catalyst)
 IT Ammoxidation catalysts
 Oxidation catalysts
 (zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidn. catalyst)
 IT Alkanes, reactions
 Alkenes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidn. catalyst)
 IT 7803-55-6, Ammonium metavanadate 10196-18-6, Zinc nitrate hexahydrate 11120-48-2, Telluric acid 12024-21-4, Gallium oxide 12054-85-2
 13494-90-1, Gallium nitrate (Ga(NO₃)₃) 21348-59-4, Niobium oxalate
 RL: CAT (Catalyst use); USES (Uses)
 (zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidn. catalyst)
 IT 406675-48-7P 406675-49-8P 406675-50-1P
 RL: CAT (Catalyst use); IMF (Industrial manufacture);
 PREP (Preparation); USES (Uses)
 (zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidn. catalyst)
 IT 79-10-7P, Acrylic acid, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidn. catalyst)
 IT 74-98-6, Propane, reactions 7664-41-7, Ammonia, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidn. catalyst)
 RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE
 (1) Cassidy, T; US 6043185 A 2000 HCAPLUS
 (2) Karim, K; WO 0029106 A 2000 HCAPLUS

- (3) Karim, K; US 6114278 A 2000 HCAPLUS
- (4) Komada, S; US 5907052 A 1999 HCAPLUS
- (5) Komada, S; US 6063728 A 2000 HCAPLUS
- (6) Rohm & Haas; EP 0962253 A 1999 HCAPLUS

L37 ANSWER 16 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:923667 HCAPLUS
 DN 136:38031
 ED Entered STN: 21 Dec 2001
 TI Catalysts for vapor-phase catalytic oxidation or vapor-phase catalytic ammoxidation of propane or isobutane
 IN Komada, Satoru; Hinago, Hidenori; Watanabe, Mamoru
 PA Asahi Kasei Kabushiki Kaisha, Japan; Nagano, Osamu
 SO PCT Int. Appl., 98 pp.
 CODEN: PIXXD2
 DT Patent
 LA Japanese
 IC ICM B01J023-28
 ICS B01J023-30; B01J023-88; B01J023-32; C07C253-24; C07C255-08;
 C07C051-215; C07C057-05; C07B061-00
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 24, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001096016	A1	20011220	WO 2001-JP5055	20010614 <--
	W: CN, DE, ID, JP, KR, US				
	DE 10195967	T	20030522	DE 2001-10195967	20010614 <--
	US 2003088118	A1	20030508	US 2002-231113	20020830 <--
PRAI	JP 2000-179687	A	20000615 <--		
	WO 2001-JP5055	W	20010614 <--		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	WO 2001096016	ICM	B01J023-28
		ICS	B01J023-30; B01J023-88; B01J023-32; C07C253-24; C07C255-08; C07C051-215; C07C057-05; C07B061-00
	WO 2001096016	ECLA	B01J023/00B; B01J023/18; B01J023/20; B01J023/28; B01J023/887K; B01J027/057T; C07C051/215; C07C051/215+57/04; C07C253/24
	US 2003088118	NCL	558/332.000; 502/215.000; 502/309.000; 502/312.000
		ECLA	B01J023/00B; B01J023/18; B01J023/20; B01J023/28; B01J023/887K; B01J027/057T; C07C051/215; C07C051/215+57/04; C07C253/24

AB An oxide catalyst comprises $M_1V_aNb_bX_cY_dZ_eQ_fO_n$ [wherein X is ≥ 1 element selected between Te and Sb, Y is ≥ 1 element selected between Al and W, Z is ≥ 1 element forming a rutile-form oxide (in catalyst production, a rutile-form oxide of element Z is used as a material for Z), Q is ≥ 1 element selected from the group consisting of Ti, Sn, Ge, Pb, Ta, Ru, Re, Rh, Ir, Pt, Cr, Mn, Tc, Os, Fe, As, Ce, Co, Mg, Ni, and Zn (in catalyst production, a compound of element Q not having a rutile-form structure is used as a material for Q), and a-e and n represent the atomic ratios of V, Nb, X, Y, Z, and O, resp., to Mo] and is used to produce an unsatd. carboxylic acid or unsatd. nitrile. Thus, propane was ammoxidized in a fluidized bed reactor at 440° over $Mo_1V_0.32Nb_0.07Sb_0.23Ti_0.35O_n$ on $43.2\% SiO_2$ to prepare acrylonitrile at selectivity 64.2% and propane conversion 50.8%.

ST propane isobutane oxidn ammoxidn catalyst; metal oxide propane oxidn catalyst; acrylonitrile manuf catalyst; molybdenum vanadium niobium oxidn ammoxidn catalyst

IT Ammoxidation catalysts
 Catalyst supports
 Oxidation catalysts
 (catalysts for vapor-phase catalytic oxidation and vapor-phase catalytic ammoxidn. of propane and isobutane)

IT Oxides (inorganic), preparation
 RL: CAT (Catalyst use); CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses)
 (catalysts for vapor-phase catalytic oxidation and vapor-phase catalytic ammoxidn. of propane and isobutane)

IT Carboxylic acids, uses
 RL: CAT (Catalyst use); USES (Uses)
 (dicarboxylic; catalysts for vapor-phase catalytic oxidation and vapor-phase catalytic ammoxidn. of propane and isobutane)

IT 144-62-7, Oxalic acid, uses 1309-64-4, Antimony oxide, uses 1317-80-2, Rutile 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 7803-55-6, Ammonium metavanadate 10421-48-4 11120-48-2, Telluric acid 12027-67-7, Ammonium heptamolybdate 12028-48-7, Ammonium metatungstate 13473-90-0, Aluminum nitrate 18282-10-5, Tin dioxide 37349-30-7, Niobic acid
 RL: CAT (Catalyst use); USES (Uses)
 (catalysts for vapor-phase catalytic oxidation and vapor-phase catalytic ammoxidn. of propane and isobutane)

IT 148047-77-2P, Antimony iron oxide (SbFeO₃) 198018-04-1P
 380413-67-2P 380413-68-3P 380413-69-4P 380413-70-7P
 380413-71-8P, Aluminum antimony oxide (Al₂SbO₃) 380413-72-9P, Aluminum antimony oxide (Al_{1.2}SbO_{3.3}) 380413-74-1P
 RL: CAT (Catalyst use); CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses)
 (catalysts for vapor-phase catalytic oxidation and vapor-phase catalytic ammoxidn. of propane and isobutane)

IT 79-10-7P, Acrylic acid, preparation 107-13-1P, Acrylonitrile, preparation
 RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
 (catalysts for vapor-phase catalytic oxidation and vapor-phase catalytic ammoxidn. of propane and isobutane)

IT 79-41-4P, Methacrylic acid, preparation 126-98-7P, Methacrylonitrile
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (catalysts for vapor-phase catalytic oxidation and vapor-phase catalytic ammoxidn. of propane and isobutane)

IT 74-98-6, Propane, reactions 75-28-5, Isobutane 7664-41-7, Ammonia, reactions 7722-84-1, Hydrogen peroxide, reactions 7782-44-7, Oxygen, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (catalysts for vapor-phase catalytic oxidation and vapor-phase catalytic ammoxidn. of propane and isobutane)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Asahi Chemical Industry Co Ltd; JP 200012599 A 2000
- (2) Mitsubishi Chemical Corporation; JP 1028862 A 1998
- (3) R P Fiber & Resin Intermediates; JP 08238428 A 1997 HCPLUS
- (4) R P Fiber & Resin Intermediates; CN 1134854 A 1997 HCPLUS
- (5) R P Fiber & Resin Intermediates; ES 2138798 T 1997 HCPLUS
- (6) R P Fiber & Resin Intermediates; CA 2167880 A 1997 HCPLUS
- (7) R P Fiber & Resin Intermediates; FR 2729651 A 1997 HCPLUS
- (8) R P Fiber & Resin Intermediates; SG 35487 A 1997
- (9) R P Fiber & Resin Intermediates; US 5663392 A 1997 HCPLUS

(10) R P Fiber & Resin Intermediates; DE 69603377 C 1997
 (11) R P Fiber & Resin Intermediates; EP 723934 A1 1997 HCPLUS
 (12) Rhone-Poulenc Chimie; CN 1120973 A 1997 HCPLUS
 (13) Rhone-Poulenc Chimie; CA 2152464 A1 1997 HCPLUS
 (14) Rhone-Poulenc Chimie; FR 2721598 A 1997 HCPLUS
 (15) Rhone-Poulenc Chimie; SG 45104 A 1997
 (16) Rhone-Poulenc Chimie; US 5686381 A 1997 HCPLUS
 (17) Rhone-Poulenc Chimie; EP 691306 A1 1997 HCPLUS
 (18) Rhone-Poulenc Chimie; DE 69503985 C 1997
 (19) Rhone-Poulenc Chimie; JP 8996 A 1997
 (20) Rhone Poulenc Fiber And Resin Intermediates; JP 2000500699 A 2000
 (21) Rhone Poulenc Fiber And Resin Intermediates; CA 2239102 A 2000 HCPLUS
 (22) Rhone Poulenc Fiber And Resin Intermediates; FR 2742678 A1 2000 HCPLUS
 (23) Rhone Poulenc Fiber And Resin Intermediates; US 6200926 B1 2000 HCPLUS
 (24) Rhone Poulenc Fiber And Resin Intermediates; WO 9723287 A1 2000 HCPLUS
 (25) Toagosei Co Ltd; JP 2000317309 A 2000 HCPLUS

L37 ANSWER 17 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2001:855682 HCPLUS

DN 136:6499

ED Entered STN: 27 Nov 2001

TI Manufacture of molybdenum- and vanadium-containing mixed oxides as gas-phase oxidation catalysts and preparation of nitriles and α,β -unsaturated carboxylic acid from alkanes using them

IN Tsuji, Hideto

PA Mitsubishi Chemical Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C01G039-00

ICS B01J023-28; B01J027-057; C07C051-215; C07C057-05; C07C057-055; C07C253-24; C07C255-08; C07B061-00

CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 23, 57

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001328812	A2	20011127	JP 2000-147776	20000519 <--
PRAI	JP 2000-147776		20000519	<--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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JP 2001328812	ICM	C01G039-00
	ICS	B01J023-28; B01J027-057; C07C051-215; C07C057-05; C07C057-055; C07C253-24; C07C255-08; C07B061-00

AB The Mo- and V-containing mixed oxides are manufactured by addition of strong acids to

liquid media containing source compds., followed by drying and firing.

Nitriles

are prepared by contact oxidation of alkanes in the presence of the above mixed oxides as catalysts. α,β -Unsatd. carboxylic acids are prepared by gas-phase oxidation of alkanes in the presence of the above mixed oxides as catalysts. Thus, reaction of propane/NH₃/air 1/1.2/15 gases in the presence of MoV0.3Nb0.12Te0.200x (prepared by treatment of ammonium paramolybdate, ammonium metavanadate, orthotelluric acid, and Nb2O5 with 10% aqueous H₂SO₄ and drying and firing) gave acrylonitrile in 91.1% conversion and 50.2% yield.

ST molybdenum vanadium oxide contact oxidn catalyst alkane; nitrile prepn ammoxidn alkane; alpha beta unsatd carboxylic acid prepn oxidn alkane;

acrylonitrile prepn ammoxidn propane; acrylic acid prepn gas phase oxidn propane

IT Ammoxidation
Ammoxidation catalysts
Oxidation
Oxidation catalysts
(gas-phase; manufacture of Mo- and V-containing mixed oxides as gas-phase oxidation or ammoxidn. catalysts for preparation of nitriles and α,β -unsatd. carboxylic acids from alkanes)

IT Nitriles, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of Mo- and V-containing mixed oxides as gas-phase oxidation or ammoxidn. catalysts for preparation of nitriles and α,β -unsatd. carboxylic acids from alkanes)

IT Alkanes, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of Mo- and V-containing mixed oxides as gas-phase oxidation or ammoxidn. catalysts for preparation of nitriles and α,β -unsatd. carboxylic acids from alkanes)

IT Carboxylic acids, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(α,β -unsatd.; manufacture of Mo- and V-containing mixed oxides as gas-phase oxidation or ammoxidn. catalysts for preparation of nitriles and α,β -unsatd. carboxylic acids from alkanes)

IT 146569-48-4P, Molybdenum niobium tellurium vanadium oxide
149920-40-1P, Bismuth molybdenum niobium tellurium vanadium oxide
193405-60-6P, Antimony molybdenum niobium vanadium oxide
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(manufacture of Mo- and V-containing mixed oxides as gas-phase oxidation or ammoxidn. catalysts for preparation of nitriles and α,β -unsatd. carboxylic acids from alkanes)

IT 79-10-7P, Acrylic acid, preparation 107-13-1P, Acrylonitrile, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of Mo- and V-containing mixed oxides as gas-phase oxidation or ammoxidn. catalysts for preparation of nitriles and α,β -unsatd. carboxylic acids from alkanes)

IT 1304-76-3, Bismuth oxide (Bi₂O₃), processes 1309-64-4, Patox C, processes 1313-96-8, Niobium pentaoxide 7664-93-9, Sulfuric acid, processes 7697-37-2, Nitric acid, processes 7803-55-6, Ammonium metavanadate 7803-68-1, Orthotelluric acid 12027-67-7, Ammonium paramolybdate
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(manufacture of Mo- and V-containing mixed oxides as gas-phase oxidation or ammoxidn. catalysts for preparation of nitriles and α,β -unsatd. carboxylic acids from alkanes)

IT 74-98-6, Propane, reactions 75-28-5, Isobutane
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of Mo- and V-containing mixed oxides as gas-phase oxidation or ammoxidn. catalysts for preparation of nitriles and α,β -unsatd. carboxylic acids from alkanes)

L37 ANSWER 18 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:702440 HCAPLUS
 DN 135:242659
 ED Entered STN: 26 Sep 2001
 TI Highly active ammoxidation catalysts for manufacture of unsaturated nitriles from olefins and their manufacture

IN Mazhar, Abdulwahed; Khalid, El Yahyaoui
 PA Syria
 SO Jpn. Kokai Tokkyo Koho, 30 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM B01J023-31
 ICS B01J037-04; C07C253-24; C07C255-08; C07B061-00
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 67

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001259420	A2	20010925	JP 2001-69672	20010313 <--
	EP 1155741	A1	20011121	EP 2001-106276	20010314 <--
	EP 1155741	B1	20030514		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO					
PRAI US 2000-189215P		P	20000314	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP	2001259420	ICM	B01J023-31
		ICS	B01J037-04; C07C253-24; C07C255-08; C07B061-00
		ECLA	B01J023/31; C07C253/26
AB	The catalysts containing bismuth, molybdenum, vanadium, antimony, and niobium are manufactured by (a) preparing a vanadium antimonate phase by heating a slurry		
	of vanadium oxide and antimony oxide thereby forming a vanadium-antimony paste and subsequently drying the paste and calcining to form the vanadium antimonate phase; (b) preparing a niobium-molybdenum solution; (c) preparing bismuth, niobium, and molybdenum mixed oxide hydrates at room temperature and without heat treating the mixed oxide hydrates; (d) combining the vanadium antimonate phase, the mixed oxide hydrates and a support thereby forming a catalyst precursor mixture; (e) stirring the catalyst precursor mixture for a period of time sufficient to form a catalyst precursor paste; and (f) drying the catalyst precursor paste to form a dried catalyst precursor material and calcining the precursor to form the catalysts. Thus, BiMoV0.095Sb0.19Nb0.21Ox/50%SiO2 was prepared and used as catalysts for ammonidin. of propylene to give 72.5% acrylonitrile with 85.4% selectivity.		
ST	ammonidin catalyst antimony bismuth molybdenum niobium vanadium oxide; acrylonitrile manuf selectivity composite metal oxide catalyst; propylene ammonidin composite metal oxide catalyst		
	IT Ammonoxidation catalysts (manufacture of highly active ammonidin. catalysts for manufacture of unsatd. nitriles from olefins)		
IT	253149-90-5P, Bismuth molybdenum niobium oxide RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)		
	(hydrate; manufacture of highly active ammonidin. catalysts for manufacture of unsatd. nitriles from olefins)		
IT	115-07-1, Propylene, reactions RL: RCT (Reactant); RACT (Reactant or reagent)		
	(manufacture of highly active ammonidin. catalysts for manufacture of acrylonitrile from)		
IT	260557-95-7P, Antimony bismuth molybdenum niobium vanadium oxide RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)		
	(manufacture of highly active ammonidin. catalysts for manufacture of unsatd.		

nitriles from olefins)

IT 107-13-1P, Acrylonitrile, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (manufacture of highly active ammoxidn. catalysts for manufacture of unsatd. nitriles from olefins)

IT 37368-11-9P, Antimony Vanadium oxide
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
 (manufacture of highly active ammoxidn. catalysts for manufacture of unsatd. nitriles from olefins)

IT 1309-64-4, Antimony Oxide (Sb₂O₃), reactions 1313-27-5, Molybdenum Oxide (MoO₃), reactions 1313-96-8, Niobium ptaoxide 1314-62-1, Vanadium oxide (V₂O₅), reactions 10361-44-1, Bismuth trinitrate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of highly active ammoxidn. catalysts for manufacture of unsatd. nitriles from olefins)

IT 7631-86-9, Silica, uses
 RL: CAT (Catalyst use); USES (Uses)
 (supports; manufacture of highly active ammoxidn. catalysts for manufacture of unsatd. nitriles from olefins)

L37 ANSWER 19 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:594385 HCAPLUS

DN 135:167166

ED Entered STN: 16 Aug 2001

TI A process for preparing a catalyst and catalytic oxidation therewith

IN Lin, Manhua

PA Rohm and Haas Company, USA

SO Eur. Pat. Appl., 12 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM B01J023-30

ICS B01J023-31; B01J027-057; C07C051-215; C07C057-04

CC 35-3 (Chemistry of Synthetic High Polymers)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1123738	A1	20010816	EP 2001-300811	20010130 <--
	R.: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	US 2002010365	A1	20020124	US 2001-754942	20010104 <--
	US 6693059	B2	20040217		
	TW 575464	B	20040211	TW 2001-90102029	20010201 <--
	CN 1310042	A	20010829	CN 2001-103218	20010207 <--
	BR 2001000469	A	20010911	BR 2001-469	20010208 <--
	JP 2001259427	A2	20010925	JP 2001-33797	20010209 <--
	US 2004116739	A1	20040617	US 2003-731512	20031209 <--
PRAI	US 2000-181412P	P	20000209	<--	
	US 2001-754942	A3	20010104	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 1123738	ICM	B01J023-30	
	ICS	B01J023-31; B01J027-057; C07C051-215; C07C057-04	
EP 1123738	ECLA	B01J023/30; B01J023/31; B01J027/057; B01J027/057T; C07C051/215; C07C051/215+57/04	<--
US 2002010365	NCL	502/308.000; 502/309.000; 502/311.000; 502/312.000; 502/313.000; 502/314.000; 502/315.000; 502/316.000;	

ECLA 502/321.000; 502/322.000; 502/353.000
 ECLA B01J023/30; B01J027/057T; C07C045/33; C07C045/33+47/22;
 C07C051/215+57/04
 US 2004116739 NCL 562/547.000; 562/546.000; 502/302.000
 ECLA B01J023/30; B01J023/31; B01J027/057; B01J027/057T;
 C07C045/33; C07C045/33+47/22; C07C051/215;
 C07C051/215+57/04

AB A process useful for the catalytic gas phase oxidation of alkanes to unsatd. aldehydes or carboxylic acids uses catalysts of particular compns. formed in a particular manner is disclosed. Thus, a catalyst comprising ammonium metatungstate 36.26, ammonium metavanadate 4.80, telluric acid 7.22, and ammonium niobium oxalate 169.4, g in water was calcined to give W1V0.3Te0.23Nb0.12O_n and oxidized propane in the presence of air and steam.

ST alkane oxidn catalyst prep; carboxylic acid unsatd aldehyde producing catalyst prep; molybdenum niobium tellurium tungsten vanadium oxide contg catalyst

IT Oxidation catalysts
 (gas-phase; preparation of alkane oxidation catalyst)

IT Carboxylic acids, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (preparation of alkane oxidation catalyst)

IT Alkanes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of alkane oxidation catalyst)

IT Aldehydes, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (unsatd.; preparation of alkane oxidation catalyst)

IT 7803-55-6, Ammonium metavanadate 11120-48-2, Telluric acid 12028-48-7,
 Ammonium metatungstate 12054-85-2 12107-01-6
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (catalyst composition; preparation of alkane oxidation catalyst)

IT 160832-88-2P, Niobium tellurium tungsten vanadium oxide
 204125-27-9P, Molybdenum niobium tellurium tungsten vanadium oxide
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP
 (Preparation); USES (Uses)
 (catalyst; preparation of alkane oxidation catalyst)

IT 115-07-1, Propylene, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of alkane oxidation catalyst)

IT 7732-18-5, Water, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (solvent; preparation of alkane oxidation catalyst)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Guttmann, A; US 4788317 A 1988 HCPLUS
- (2) Hoechst Ag; DE 19717076 A 1998 HCPLUS
- (3) Lyons, J; US 5990348 A 1999 HCPLUS
- (4) Standard Oil Co Ohio; EP 0389701 A 1990 HCPLUS

L37 ANSWER 20 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2001:479330 HCPLUS

DN 135:77251

ED Entered STN: 03 Jul 2001

TI Metal oxide catalysts and manufacture of acrylonitrile or methacrylonitrile using them

IN Komata, Satoru; Inoue, Tomonari

PA Asahi Chemical Industry Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent
 LA Japanese
 IC ICM B01J023-36
 ICS B01J023-28; C07C253-24; C07C255-08; C07B061-00
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 56

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001179094	A2	20010703	JP 1999-368712	19991227 <--
PRAI	JP 1999-368712			19991227 <--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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JP 2001179094 ICM B01J023-36
 ICS B01J023-28; C07C253-24; C07C255-08; C07B061-00

AB The catalysts, used in gas phase catalytic ammonoxidn. of propane or isobutane, comprise Mo₁V_aNb_bSb_cZ_dO_n (Z = Re, Hf; a-n = atomic ratio to Mo; a = 0.1-1; b = 0.01-1; c = 0.01-1; d = 0.001-0.1; n = number determined according to valence of component metals). Thus, 15% H₂O₂ solution, an aqueous solution containing niobium hydroxide oxide and H₂C₂O₄·2H₂O, and an aqueous solution containing NH₄ReO₄ were successively added into an aqueous solution containing (NH₄)₆Mo₇O₂₄·4H₂O, NH₄VO₃, Sb₂O₃, and silica sol, spray-dried, and sintered to give a catalyst comprising Mo₁V_{0.33}Sb_{0.22}Nb_{0.07}Re_{0.02}O_n supported on SiO₂. Propane was ammonoxidized by using the catalyst to give acrylonitrile with selectivity 63.0 and 62.9% at conversion 49.7 and 49.3% after 500 and 1000 h, resp.

ST propane ammonoxidn catalyst rhenium metal oxide; acrylonitrile manuf catalyst composite metal oxide; isobutane ammonoxidn catalyst hafnium metal oxide; methacrylonitrile manuf catalyst composite metal oxide

IT Ammonoxidation catalysts
 (metal oxide catalysts for manufacture of acrylonitrile or methacrylonitrile)

IT Silica gel, uses
 RL: CAT (Catalyst use); USES (Uses)
 (supports; in manufacture of metal oxide catalysts for manufacture of acrylonitrile or methacrylonitrile)

IT 144-62-7, Oxalic acid, uses 7722-84-1, Hydrogen peroxide, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (in manufacture of metal oxide catalysts for manufacture of acrylonitrile or methacrylonitrile)

IT 1309-64-4, Antimony oxide (Sb₂O₃), reactions 7803-55-6, Ammonium metavanadate 12027-67-7, Ammonium heptamolybdate 13598-65-7, Ammonium perrhenate 17475-67-1, Tetrakis(acetylacetonato)hafnium 37349-30-7, Niobium hydroxide oxide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (in manufacture of metal oxide catalysts for manufacture of acrylonitrile or methacrylonitrile)

IT 347142-99-8P 347143-00-4P
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
 (metal oxide catalysts for manufacture of acrylonitrile or methacrylonitrile)

IT 107-13-1P, Acrylonitrile, preparation 126-98-7P, Methacrylonitrile
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (metal oxide catalysts for manufacture of acrylonitrile or methacrylonitrile)

IT 74-98-6, Propane, reactions 75-28-5, Isobutane

RL: RCT (Reactant); RACT (Reactant or reagent)
 (metal oxide catalysts for manufacture of acrylonitrile or
 methacrylonitrile)

L37 ANSWER 21 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2001:194552 HCAPLUS
 DN 134:237954
 ED Entered STN: 22 Mar 2001
 TI Manufacture of oxidation catalyst for acrylic acid synthesis from propane
 IN Tu, Xin Lin; Takahashi, Mamoru; Azuma, Hiroshi
 PA Toa Gosei Chemical Industry Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 10 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM B01J023-28
 ICS B01J027-057; B01J037-02; C07C051-215; C07C057-05; C07B061-00
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001070788	A2	20010321	JP 1999-250123	19990903 <--
PRAI	JP 1999-250123			19990903	<--

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2001070788	ICM	B01J023-28
	ICS	B01J027-057; B01J037-02; C07C051-215; C07C057-05; C07B061-00

AB The catalyst is manufactured by (a) reacting V+5 and Sb+3 at $\geq 70^\circ$ in an aqueous medium containing Mo+6 and (b) mixing the resulting products with ammonium ion and oxalate ion in an aqueous solution containing Nb and/or Ta and calcining the resulting mixture, where in steps (a) and/or (b), Y-containing compds. (Y = Na, K, etc.) are mixed or Y-containing compds and Z-containing compds. (Z = Ag, Zr, etc.) are mixed and in step (b) 2-7 mol NH₄ ion and/or 4-12 mol oxalate ion (based on 1 mol Nb and/or Ta) are used to give MoVgSbhXiYjZkOm (X = Nb, Ta; Y = Na, K, etc.; Z = Ag, Zr; g, h = 0.01-1.5, h/g = 0.3-1; i = 0.001-3.0; j = 0.0001-0.1; k = 0-0.05; m = no of O to satisfy valency of the metals), which is further impregnated with A-containing compds. (A = K, Tl, Sb, etc.) and calcining. A mixed oxide 1/0.3/0.23/0.08/0.03 of Mo/V/Sb/Nb/K was prepared, impregnated with aqueous KHCO₃, baked, and used to oxidize C₃H₈ into acrylic acid with selectivity 62.25% and yield 34%.

ST oxidn catalyst acrylic acid synthesis propane; molybdenum vanadium antimony niobium potassium oxide catalyst

IT Oxidation catalysts

(manufacture of oxidation catalyst for acrylic acid synthesis from propane)

IT 207615-99-4P 330154-84-2P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(manufacture of oxidation catalyst for acrylic acid synthesis from propane)

IT 79-10-7P, Acrylic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(manufacture of oxidation catalyst for acrylic acid synthesis from propane)

IT 74-98-6, Propane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(manufacture of oxidation catalyst for acrylic acid synthesis from propane)

L37 ANSWER 22 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:427997 HCAPLUS
 DN 133:43945
 ED Entered STN: 27 Jun 2000
 TI Ammonoxidation catalysts and manufacture of (meth)acrylonitrile from propane or isobutane
 IN Inoue, Tomoya; Hinako, Hidenori
 PA Asahi Chemical Industry Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C07C255-08
 ICS B01J023-28; B01J023-30; B01J023-32; B01J023-68; B01J023-88;
 B01J027-057; B01J027-199; C07C253-24; C07B061-00
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 67
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000178242	A2	20000627	JP 1998-354398	19981214 <--
PRAI	JP 1998-354398			19981214 <--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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JP 2000178242	ICM	C07C255-08 ICS B01J023-28; B01J023-30; B01J023-32; B01J023-68; B01J023-88; B01J027-057; B01J027-199; C07C253-24; C07B061-00
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AB (meth)acrylonitrile is manufactured by gas-phase ammonoxidn. of propane or isobutane in the presence of MoVpXqNbZrsZtOn (X = Te and/or Sb; Z = Ti, W, Cr, Ta, Sn, Y, Yb La, Ce, Bi, Hf, Mn, Re, Fe, Ru, Co, Rh, Ni, Pd, Pt, Ag, Zn, B, Al, Ga, In, Ge, Pb, P, Pr, Nd, Sm, Gd, Pm, Eu, Tb, Dy, Ho, Er, Tm, Lu, alkaline earth metal; $0.1 \leq p \leq 0.6$; $0.01 \leq q, r \leq 0.6$; $0.001 \leq s \leq 0.3$; $0 \leq t \leq 1$; n = number defined by the oxidation number of the constituting metals) supported on 20-60% SiO₂. The catalysts are easily prepared by spray drying solns. containing the catalyst components, then burning at 500-700° under O-free gas. A gaseous mixture of propane, NH₃, O, and He was passed through a fixed bed packed with MoV0.33Nb0.11Te0.22Zr0.05On supported on 30% silica at 415° and 1 atm with contact time 4.1 s-g/cc to give 53.5% acrylonitrile.

ST molybdenum vanadium niobium zirconium oxide ammonoxidn; methacrylonitrile acrylonitrile manuf ammonoxidn catalyst; propane isobutane ammonoxidn catalyst support silica

IT Ammonoxidation catalysts

(manufacture of (meth)acrylonitrile from propane or isobutane)

IT 1314-23-4, Zirconium oxide, reactions 7440-67-7D, Zirconium, tetrabasic acids, salts, reactions 13826-66-9, Zirconium oxide dinitrate 14475-63-9, Zirconium hydroxide

RL: RCT (Reactant); RACT (Reactant or reagent)

(catalyst prepared from; manufacture of (meth)acrylonitrile from propane or isobutane)

IT 7631-86-9, Silica, uses

RL: CAT (Catalyst use); USES (Uses)

(catalyst support; manufacture of (meth)acrylonitrile from propane or isobutane)

IT 275817-40-8P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP

(Preparation); USES (Uses)

(catalyst, supported on silica; manufacture of (meth)acrylonitrile from

propane or isobutane)

IT 107-13-1P, Acrylonitrile, preparation 126-98-7P, Methacrylonitrile
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (manufacture of (meth)acrylonitrile from propane or isobutane)

IT 74-98-6, Propane, reactions 75-28-5, Isobutane
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of (meth)acrylonitrile from propane or isobutane)

L37 ANSWER 23 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1999:684479 HCAPLUS
 DN 131:342549
 ED Entered STN: 28 Oct 1999
 TI Combinatorial discovery of oxidative dehydrogenation catalysts within the Mo-V-Nb-O system
 AU Cong, Peijun; Dehestani, Ahmad; Doolen, Robert; Giaquinta, Daniel M.; Guan, Shenheng; Markov, Victor; Poojary, Damodara; Self, Kyle; Turner, Howard; Weinberg, W. Henry
 CS Symyx Technologies, Santa Clara, CA, 95051, USA
 SO Proceedings of the National Academy of Sciences of the United States of America (1999), 96(20), 11077-11080
 CODEN: PNASA6; ISSN: 0027-8424
 PB National Academy of Sciences
 DT Journal
 LA English
 CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 23
 AB Combinatorial methodologies were used for the synthesis and screening of mixed metal oxide heterogeneous catalysts. Primary screening at low reactant conversions at a throughput of greater than 10,000 catalyst compns. per mo was performed by using simultaneous MS and photothermal deflection spectroscopy on spatially separated thick film catalysts with \approx 200 μ g per catalyst prepared by using automated liquid dispensing. Secondary screening under realistic operating conditions was performed at a throughput of greater than 3,000 catalyst compns. per mo on \approx 50 mg of catalyst in an array of fixed bed microreactors with gas chromatograph detection. The approach was validated by the discovery of catalysts with superior performance to those previously described for the oxidative dehydrogenation of ethane to ethylene. We show the full implementation and integration of combinatorial methodologies for synthesis, screening, discovery, and optimization of multicomponent heterogeneous catalysts.
 ST combinatorial discovery oxidative dehydrogenation catalyst; molybdenum vanadium niobium oxide oxidative dehydrogenation catalyst combinatorial discovery; ethane oxidative dehydrogenation catalyst combinatorial discovery
 IT Combinatorial library
 (combinatorial discovery of oxidative dehydrogenation catalysts within Mo-V-Nb-O system)
 IT Dehydrogenation catalysts
 (oxidative; combinatorial discovery of oxidative dehydrogenation catalysts within Mo-V-Nb-O system)
 IT 51142-11-1P, Antimony lithium molybdenum vanadium oxide 145054-98-4P, Molybdenum niobium vanadium oxide 202708-41-6P, Antimony calcium molybdenum niobium vanadium oxide 250211-92-8P 250211-93-9P 250211-94-0P
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (combinatorial discovery of oxidative dehydrogenation catalysts within Mo-V-Nb-O system)
 IT 74-84-0, Ethane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
 (combinatorial discovery of oxidative dehydrogenation catalysts within
 Mo-V-Nb-O system)

IT 74-85-1P, Ethene, preparation 250211-95-1P
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (combinatorial discovery of oxidative dehydrogenation catalysts within
 Mo-V-Nb-O system)

RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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 Catalysis 1997
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 1992, P753
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L37 ANSWER 24 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN

AN 1999:311446 HCPLUS

DN 130:338521

ED Entered STN: 21 May 1999

TI Ammonoxidation catalysts and their use for manufacture of acrylonitrile from
 propane or methacrylonitrile from isobutane

IN Komada, Satoru; Hamada, Kazuyuki

PA Asahi Kasei Kogyo K. K., Japan

SO Ger. Offen., 20 pp.

CODEN: GWXXBX

DT Patent

LA German

IC ICM B01J027-057

ICS B01J023-28; C07C253-24; C07C255-08

ICI B01J027-057, B01J103-50; B01J027-057, B01J103-40; B01J027-057, B01J103-42;
 B01J027-057, B01J103-26

CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 67

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DE 19847656	A1	19990506	DE 1998-19847656	19981015 <--
JP 11244702	A2	19990914	JP 1998-286577	19981008 <--
CN 1216721	A	19990519	CN 1998-124536	19981015 <--
CN 1088398	B	20020731		
US 6043186	A	20000328	US 1998-172648	19981015 <--
HK 1018947	A1	20030314	HK 1999-104012	19990917 <--
PRAI JP 1997-282304	A	19971015	<--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 19847656	ICM	B01J027-057
	ICS	B01J023-28; C07C253-24; C07C255-08
	ICI	B01J027-057, B01J103-50; B01J027-057, B01J103-40; B01J027-057, B01J103-42; B01J027-057, B01J103-26
DE 19847656	ECLA	B01J023/28; B01J027/057T; C07C253/24
US 6043186	NCL	502/312.000; 502/215.000; 502/305.000; 502/311.000; 502/321.000; 502/353.000; 558/323.000
	ECLA	B01J023/28; B01J027/057T; C07C253/24

AB The catalysts, which may be supported on SiO₂, are mixed oxides represented as MoVaNb_aXcZdEeOn, where X is Sb or Te, Z is Yb, Dy, or Er, E is Nd, Sm, La, Pr, Eu, Gd, Tb, Ho, Tm, Lu, or Sc, a = 0.1-1.0, b and c = 0.01-1.0, d and e = 0-0.1, d + e = 0.001-0.1, and n has the value required by stoichiometry. Thus, a mixed oxide MoV0.34Nb0.14Te0.24Yb0.01On was prepared from (NH₄)₆Mo₇O₂₄, NH₄VO₃, H₆TeO₆, Nb₂O₅ hydrate, oxalic acid, and Yb(OAc)₃, spray-dried, oxidized for 2 h at 275° in air, and calcined for 2 h at 600° under N. Contacting 1.0:1.2:2.8:12.0 (molar) C₃H₈-NH₃-O₂-He with the catalyst at 440° and atmospheric pressure produced acrylonitrile in 57.1% yield (based on propane), compared with 55.3% when the Yb was omitted from the catalyst.

ST acrylonitrile manuf ammoxidn catalyst; mixed oxide ammoxidn catalyst; methacrylonitrile manuf ammoxidn catalyst; molybdenum tellurium vanadium rare earth oxide.

IT Ammoxidation catalysts

(ammoxidn. catalysts for manufacture of (meth)acrylonitrile)

IT 224324-27-0P 224324-30-5P 224324-34-9P 224324-37-2P

224324-44-1P 224324-48-5P 224324-51-0P

224324-54-3P 224324-57-6P 224324-60-1P 224324-63-4P

224324-67-8P 224324-70-3P 224324-73-6P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(ammoxidn. catalysts for manufacture of (meth)acrylonitrile)

IT 107-13-1P, Acrylonitrile, preparation 126-98-7P, Methacrylonitrile

RL: IMF (Industrial manufacture); PREP (Preparation)

(ammoxidn. catalysts for manufacture of (meth)acrylonitrile)

IT 74-98-6, Propane, reactions 75-28-5, Isobutane

RL: RCT (Reactant); RACT (Reactant or reagent)

(ammoxidn. catalysts for manufacture of (meth)acrylonitrile)

IT 7631-86-9, Silica, uses

RL: CAT (Catalyst use); USES (Uses)

(catalyst support; ammoxidn. catalysts for manufacture of

(meth)acrylonitrile)

L37 ANSWER 25 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN

AN 1998:423968 HCPLUS

DN 129:149337

ED Entered STN: 10 Jul 1998

TI Manufacture of ethylene by oxidative dehydrogenation of ethane

IN Koyasu, Sachio; Wajiki, Noboru

PA Mitsubishi Chemical Industries Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 13 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C07C011-04
 ICS B01J023-22; C07C005-48; C07B061-00
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 23, 45, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10175885	A2	19980630	JP 1997-101450	19970418 <--
PRAI	JP 1996-105104	A	19960425	<--	
	JP 1996-272190	A	19961015	<--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 10175885	ICM	C07C011-04
		ICS B01J023-22; C07C005-48; C07B061-00

AB Ethylene is manufactured from ethane in the presence of complexed metal oxide catalysts and mol. oxygen. The complexed metal oxides contain molybdenum, vanadium, and antimony as essential components and have certain X-ray diffraction pattern.

ST ethylene manuf ethane dehydrogenation; catalyst metal oxide ethylene manuf
IT Oxides (inorganic), preparation

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation);
USES (Uses)

(complexed metal oxide catalysts for manufacture of ethylene by oxidative dehydrogenation of ethane)

IT Dehydrogenation catalysts
(oxidative; complexed metal oxide catalysts for manufacture of ethylene by oxidative dehydrogenation of ethane)

IT 55521-81-8P, Antimony molybdenum vanadium oxide 61115-21-7P, Antimony iron molybdenum vanadium oxide 170621-18-8P 193405-60-6P

198018-04-1P 202523-10-2P 204920-27-4P

210831-51-9P 210831-55-3P 210831-57-5P 210831-59-7P

210831-61-1P 210831-65-5P 210831-68-8P 210831-71-3P 210831-73-5P,

Antimony molybdenum vanadium zinc oxide 210831-75-7P 210831-78-0P

210831-80-4P, Antimony molybdenum tin vanadium oxide 210831-82-6P,

Antimony lead molybdenum vanadium oxide 210831-85-9P

210831-87-1P

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(complexed metal oxide catalysts for manufacture of ethylene by oxidative dehydrogenation of ethane)

IT 74-85-1P, Ethene, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(manufacture of ethylene by oxidative dehydrogenation of ethane)

IT 74-84-0, Ethane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(manufacture of ethylene by oxidative dehydrogenation of ethane)

IT 144-62-7, Ethanedioic acid, reactions 1309-64-4, Antimony trioxide,

reactions 7631-86-9, Silica, reactions 7803-55-6, Ammonium

metavanadate 10026-22-9, Cobalt nitrate hexahydrate 10031-43-3,

Copper(II) nitrate trihydrate 10099-74-8, Lead nitrate 10196-18-6,

Zinc nitrate hexahydrate 10377-66-9, Manganese nitrate 12028-48-7,

Ammonium metatungstate 12054-85-2 12627-00-8, Niobium oxide

13268-42-3 13465-14-0 13478-00-7, Nickel nitrate hexahydrate

13548-38-4, Chromium nitrate 14475-63-9, Zirconium hydroxide

18282-10-5, Tin dioxide 21348-60-7, Tantalum oxalate 25749-23-9,
 Aluminum nitrate hexahydrate 37382-23-3, Cerium hydroxide 94844-97-0,
 Ammonium titanium oxalate 168547-43-1
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of complexed metal oxide catalysts for manufacture of ethylene
 by oxidative dehydrogenation of ethane)

L37 ANSWER 26 OF 27 HCPLUS COPYRIGHT 2005 ACS on STN
 AN 1998:307084 HCPLUS
 DN 129:17245
 ED Entered STN: 25 May 1998
 TI Catalysts for gas-phase oxidation of isobutane and their manufacture
 IN Okusako, Akinori; Ui, Toshiaki; Nagai, Koichi
 PA Sumitomo Chemical Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM B01J023-28
 ICS B01J023-30; B01J023-31; B01J023-68; B01J023-88; B01J027-057;
 C07B061-00; C07C011-09; C07C027-12; C07C047-22; C07C057-05
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 23, 35, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10128112	A2	19980519	JP 1996-290087	19961031 <--
PRAI	JP 1996-290087			19961031 <--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP	10128112	ICM	B01J023-28
		ICS	B01J023-30; B01J023-31; B01J023-68; B01J023-88; B01J027-057; C07B061-00; C07C011-09; C07C027-12; C07C047-22; C07C057-05

AB The catalysts comprise $MoaVbXcYdZeOf$ ($X = Sb, Te; Y = As, B, Ge; Z = K, Cs, Rb, Ca, Mg, Tl, Cr, Mn, F, Co, Ni, Cu, Ag, Bi, Al, Ga, In, Sn, Zn, La, Ce, Y, W, Nb, Ta$; if $a = 12$, then $0 < b \leq 6$, $0 < c \leq 20$, $0 \leq d \leq 6$, $0 \leq e \leq 6$). The catalysts are manufactured by calcination of precursors under inert gases. Thus, a mixture

of $Nb(HC2O4)5$, vanadyl oxalate, $(NH4)_6Mo7O24$, and $Sb2O3$ was calcined at 600° for 2 h to give $Mo12V3Sb9Nb1.5Ox$. Isobutane/O/N/H₂O were passed through the catalyst at 425° , 152 kPa, and 1000/h to result in isobutane conversion 6.3% and selectivity for isobutylene,

methacrolein, and methacrylic acid 11.9, 23.8, and 7.8%, resp.

ST isobutane oxidn catalyst metal oxide; isobutylene manuf isobutane oxidn catalyst; methacrolein manuf isobutane oxidn catalyst; methacrylic acid manuf isobutane oxidn catalyst

IT Oxidation catalysts
 (gas-phase; mixed metal oxide catalysts for gas-phase oxidation of isobutane)

IT Oxides (inorganic), preparation
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation);
 USES (Uses)

(mixed metal oxide catalysts for gas-phase oxidation of isobutane)

IT 55521-81-8P, Antimony molybdenum vanadium oxide 146569-48-4P, Molybdenum niobium tellurium vanadium oxide 193405-60-6P, Antimony molybdenum niobium vanadium oxide 198018-00-7P, Antimony germanium molybdenum

niobium vanadium oxide 198018-02-9P, Antimony molybdenum niobium tin vanadium oxide 198018-04-1P, Antimony iron molybdenum niobium vanadium oxide.

RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)

(mixed metal oxide catalysts for gas-phase oxidation of isobutane)

IT 78-85-3P, Methacrolein 79-41-4P, Methacrylic acid, preparation
115-11-7P, Isobutylene, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(mixed metal oxide catalysts for gas-phase oxidation of isobutane)

IT 75-28-5, Isobutane

RL: RCT (Reactant); RACT (Reactant or reagent)

(mixed metal oxide catalysts for gas-phase oxidation of isobutane)

L37 ANSWER 27 OF 27 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1998:289594 HCAPLUS

DN 129:15908

ED Entered STN: 18 May 1998

TI Preparation of acrylic acid from propane using mixed metal oxide catalysts

IN Takahashi, Mamoru; To, Shinrin; Hirose, Toshiro

PA Toa Gosei Chemical Industry Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C07C057-05

ICS B01J023-28; C07C051-215; C07B061-00

CC 23-16 (Aliphatic Compounds)

Section cross-reference(s): 35, 67

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10120617	A2	19980512	JP 1996-297755	19961021 <--
	FR 2754817	A1	19980424	FR 1997-13152	19971021 <--
	FR 2754817	B1	20000317		
	US 5994580	A	19991130	US 1997-955246	19971021 <--
	US 6060422	A	20000509	US 1999-339230	19990624 <--
PRAI	JP 1996-297755	A	19961021	<--	
	JP 1997-54200	A	19970221	<--	
	US 1997-955246	A3	19971021	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	JP 10120617	ICM	C07C057-05
		ICS	B01J023-28; C07C051-215; C07B061-00
	FR 2754817	ECLA	B01J023/28; C07C051/215+57/04
	US 5994580	NCL	562/549.000; 502/311.000; 502/312.000
		ECLA	B01J023/28; C07C051/215+57/04
	US 6060422	NCL	502/312.000; 423/594.100; 423/595.000; 423/598.000; 423/604.000; 423/606.000; 423/607.000; 423/608.000; 423/610.000; 423/617.000; 423/618.000; 423/632.000; 502/311.000; 502/314.000; 502/315.000; 502/316.000; 502/321.000
		ECLA	B01J023/28

AB Acrylic acid (I) is prepared by gas-phase oxidation of propane using mixed metal oxide catalysts prepared by supporting compds. of Na, K, Rb, Cs, P, and/or As on metal oxides having atomic ratio of MoViSbjAk (A = Nb, Ta, Sn, W, Ti, Ni, Fe, Cr, Co; i, j, k = 0.001-3.0), followed by calcination. A gaseous mixture comprising propane 4.4, O 7.0, N 26.3, and steam 62.3 volume% was charged at SV 1600/h into a reactor containing mixed metal oxide

(Mo/Sb/V/Nb/K = 1.0/0.25/0.3/0.12/0.013 by atomic ratio) at 400° to give I with selectivity 69.7% and conversion 27.1%.

ST acrylic acid prep; propane oxidn catalyst molybdenum vanadium oxide; antimony niobium potassium oxide catalyst oxidn; gas phase oxidn propane catalyst prep

IT Oxidation catalysts
 (gas-phase; preparation of acrylic acid from propane using mixed metal oxide catalysts)

IT 7439-89-6D, Iron, mixed metal oxides, uses 7440-02-0D, Nickel, mixed metal oxides, uses 7440-23-5D, Sodium, mixed metal oxides, uses 7440-25-7D, Tantalum, mixed metal oxides, uses 7440-31-5D, Tin, mixed metal oxides, uses 7440-32-6D, Titanium, mixed metal oxides, uses 7440-33-7D, Tungsten, mixed metal oxides, uses 7440-38-2D, Arsenic, mixed metal oxides, uses 7440-46-2D, Cesium, mixed metal oxides, uses 7440-47-3D, Chromium, mixed metal oxides, uses 7440-48-4D, Cobalt, mixed metal oxides, uses

RL: CAT (Catalyst use); USES (Uses)
 (preparation of acrylic acid from propane using mixed metal oxide catalysts)

IT 207615-99-4P 207616-00-0P 207616-02-2P
 207616-04-4P
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (preparation of acrylic acid from propane using mixed metal oxide catalysts)

IT 79-10-7P, Acrylic acid, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (preparation of acrylic acid from propane using mixed metal oxide catalysts)

IT 74-98-6, Propane, reactions 298-14-6, Potassium bicarbonate 7783-28-0, Diammonium phosphate 13126-12-0, Rubidium nitrate 193405-60-6, Antimony molybdenum niobium vanadium oxide
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of acrylic acid from propane using mixed metal oxide catalysts)

=> => d 138 all tot

L38 ANSWER 1 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:117419 HCAPLUS
 DN 140:170371
 ED Entered STN: 13 Feb 2004
 TI Production method of oxidation reaction catalyst
 IN Hinako, Hidenori
 PA Asahi Kasei Chemical Corporation, Japan
 SO Jpn. Kokai Tokkyo Koho, 12 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM B01J023-28
 ICS B01J037-03; C07C051-215; C07C057-05; C07C253-24; C07C255-08;
 C07B061-00
 CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 23

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004041839	A2	20040212	JP 2002-199628	20020709 <--
PRAI JP 2002-199628		20020709	<--	
CLASS				
PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES				
JP 2004041839	ICM	B01J023-28		

JP 2004041839 ICS B01J037-03; C07C051-215; C07C057-05; C07C253-24;
 C07C255-08; C07B061-00
 FTERM 4G069/AA02; 4G069/AA03; 4G069/AA08; 4G069/BA02A;
 4G069/BA02B; 4G069/BB06A; 4G069/BB06B; 4G069/BB06C;
 4G069/BC08A; 4G069/BC16A; 4G069/BC16B; 4G069/BC17A;
 4G069/BC18A; 4G069/BC21A; 4G069/BC22A; 4G069/BC23A;
 4G069/BC25A; 4G069/BC25B; 4G069/BC25C; 4G069/BC26A;
 4G069/BC26B; 4G069/BC35A; 4G069/BC38A; 4G069/BC40A;
 4G069/BC50A; 4G069/BC51A; 4G069/BC52A; 4G069/BC54A;
 4G069/BC54B; 4G069/BC54C; 4G069/BC55A; 4G069/BC55B;
 4G069/BC55C; 4G069/BC56A; 4G069/BC58A; 4G069/BC58C;
 4G069/BC59A; 4G069/BC59B; 4G069/BC59C; 4G069/BC60A;
 4G069/BC60C; 4G069/BC62A; 4G069/BC64A; 4G069/BC66C;
 4G069/BC67A; 4G069/BC67C; 4G069/BC68A; 4G069/BC68C;
 4G069/BC70A; 4G069/BC71A; 4G069/BC72A; 4G069/BC75A;
 4G069/BD03A; 4G069/BD07A; 4G069/BD10A; 4G069/CB07;
 4G069/CB17; 4G069/CB53; 4G069/CB54; 4G069/CB74;
 4G069/FA01; 4G069/FA02; 4G069/FB06; 4G069/FB09;
 4G069/FB30; 4G069/FC02; 4G069/FC07; 4G069/FC08;
 4H006/AA02; 4H006/AC46; 4H006/AC54; 4H006/BA07;
 4H006/BA09; 4H006/BA10; 4H006/BA12; 4H006/BA13;
 4H006/BA14; 4H006/BA15; 4H006/BA18; 4H006/BA22;
 4H006/BA30; 4H006/BA35; 4H006/BA81; 4H006/BB61;
 4H006/BC10; 4H006/BC11; 4H006/BC18; 4H006/BC31;
 4H006/BC32; 4H006/BE14; 4H006/BE30; 4H006/BS10;
 4H006/QN24; 4H039/CA65; 4H039/CA70; 4H039/CC30;
 4H039/CL50

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AB The invention relates to a production method of an oxidation reaction catalyst represented by $M_1VaY_bNb_cBi_dZeOn$ [$Y = Sb$ and/or Te ; $Z = Ti, W, Cr, Al, Ta, Zr, Hf, Mn, Re, Fe, Ru, Rh, Ni, Co, Pd, pt, Zn, B, Ga, In, Ge, Sn, P, Pb, Y, rare earth elements, and alkali earth elements;$
 $0.1 \leq a \leq 1.0, 0.01 \leq b \leq 0.60,$
 $0.01 \leq c \leq 0.30, 0.01 \leq d \leq 0.5, 0 \leq e \leq 1,$
 and $n = \text{atomic ratio determined by oxidation states of constituent metals}].$

The catalyst is used to produce unsatd. nitriles and carbonic acids from propane and isobutane by ammoxidn. and oxidation reactions in gas phase contact reactions. Thus the catalyst production involves the preparation of the solution containing Mo, V, Nb, Z, Sb and/or Te precursors, and the composite oxide represented by Bi_1X_qOm [$X = Mo, V, W, Nb, Fe, Ni, Cr and Co;$
 $0.1 \leq q \leq 30$, and $m = \text{atomic ratio determined by oxidation states of constituent metals}].$

ST oxidn catalyst aluminum antimony bismuth molybdenum niobium vanadium oxide; ammoxidn catalyst aluminum antimony bismuth molybdenum niobium vanadium oxide

IT Ammoxidation catalysts

Oxidation catalysts
 (ammoxidn. and oxidation reaction catalysts)

IT 260557-95-7 656829-20-8

RL: CAT (Catalyst use); USES (Uses)
 (ammoxidn. and oxidation reaction catalysts)

IT 13595-85-2P, Bismuth molybdenum oxide ($Bi_2Mo_3O_12$)

RL: PNU (Preparation, unclassified); PREP (Preparation)
 (ammoxidn. and oxidation reaction catalysts)

IT 74-98-6, Propane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
 (ammoxidn. and oxidation reaction catalysts)

AN 2003:504752 HCAPLUS
 DN 139:74539
 ED Entered STN: 02 Jul 2003
 TI Production method of oxidation or ammoxidation catalyst
 IN Kato, Takaaki; Komata, Satoru
 PA Asahi Kasei Corporation, Japan
 SO Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM B01J023-28
 ICS B01J037-00; B01J037-04; C07B061-00; C07C051-215; C07C051-25;
 C07C253-24; C07C253-26
 CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
PI JP 2003181287	A2	20030702	JP 2001-379626	20011213 <--
PRAI JP 2001-379626		20011213	<--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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JP 2003181287	ICM	B01J023-28
		ICS B01J037-00; B01J037-04; C07B061-00; C07C051-215; C07C051-25; C07C253-24; C07C253-26

AB The invention refers to a production method of an oxidation or ammoxidn. catalyst, suitable for use in the production of saturated or unsatd. nitriles, comprising a raw material mixing process, a drying process and a calcining process, wherein the raw materials stay in the pipes during the mixing and drying process for 3 s to 1 h to control the gelation process. The oxide catalyst may be given as MoVaNb_b(Sb,Te)On [0.01 ≤ a ≤ 1; 0.01 ≤ b ≤ 1; 0.01 ≤ c ≤ 1; n = determined by valence of metals].
 ST ammoxidn oxidn catalyst molybdenum vanadium niobium tellurium antimony oxide; nitrile manuf molybdenum vanadium niobium tellurium antimony oxide catalyst
 IT Ammoxidation catalysts
 Oxidation catalysts
 (production method of oxidation or ammoxidn. catalyst)
 IT Nitriles, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (production method of oxidation or ammoxidn. catalyst)
 IT 146569-48-4, Molybdenum niobium tellurium vanadium oxide
 149920-38-7, Antimony molybdenum niobium tellurium vanadium oxide
 RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
 (production method of oxidation or ammoxidn. catalyst)
 IT 193405-60-6P, Antimony molybdenum niobium vanadium oxide
 RL: CAT (Catalyst use); DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (production method of oxidation or ammoxidn. catalyst)
 IT 74-98-6, Propane, reactions 1309-64-4, Antimony oxide, reactions 1313-96-8, Niobium oxide 7803-55-6, Ammonium metavanadate 12027-67-7, Ammonium heptamolybdate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (production method of oxidation or ammoxidn. catalyst)

L38 ANSWER 3 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2003:470372 HCAPLUS
 DN 139:36960
 ED Entered STN: 20 Jun 2003

TI Methods and systems for high throughput analysis
 IN Linsen, Michael William; Schmitt, Edward Albert; Schure, Mark Richard
 PA Rohm and Haas Company, USA
 SO Eur. Pat. Appl., 23 pp.
 CODEN: EPXXDW

DT Patent

LA English

IC ICM G01N033-50

CC 35-2 (Chemistry of Synthetic High Polymers)

Section cross-reference(s) : 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1319951	A2	20030618	EP 2002-258484	20021209 <--
	EP 1319951	A3	20040204		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
	US 6901334	B2	20050531	US 2002-307654	20021202 <--
	ZA 2002009803	A	20030611	ZA 2002-9803	20021203 <--
	CN 1427261	A	20030702	CN 2002-155921	20021211 <--
	JP 2003227819	A2	20030815	JP 2002-359721	20021211 <--
	BR 2002005254	A	20040720	BR 2002-5254	20021213 <--
	SG 104991	A1	20040730	SG 2002-7626	20021217 <--
	US 2005019940	A1	20050127	US 2004-910974	20040804 <--
PRAI	US 2001-339903P	P	20011217	<--	
	US 2002-307654	A3	20021202		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US	EP 1319951	ICM	G01N033-50
	EP 1319951	ECLA	B01J019/00C; G01N031/10
	6901334	NCL	702/022.000; 702/022.000; 702/030.000; 702/182.000; 702/189.000; 422/211.000; 422/131.000; 423/213.200; 423/230.000; 502/103.000
		ECLA	B01J019/00C; G01N031/10
	2005019940	NCL	436/139.000; 422/068.100
	ECLA	B01J019/00C; G01N031/10	

AB Methods of analyzing processes for making catalysts and/or certain properties of catalysts using a plurality of reaction zones are provided. The methods have the capability to define and execute, in rapid succession, a plurality of expts. under disparate reaction conditions. An operator may define and execute a plurality of expts. on user-defined quantities of disparate catalysts, using user-defined input feeds, residence times, and temperature profiles. Anal. of multi-metal oxide catalysts for converting propane to acrylic acid was exemplified.

ST propane conversion metal oxide catalyst acrylic acid; metal oxide catalyst throughput analysis

IT Oxidation

Oxidation catalysts

(high throughput anal. of catalysts for conversion of propane to acrylic acid)

IT Oxides (inorganic), uses

RL: CAT (Catalyst use); USES (Uses)

(high throughput anal. of catalysts for conversion of propane to acrylic acid)

IT Alkanes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(high throughput anal. of catalysts for oxidation of alkanes)

IT 146569-48-4 193405-60-6 261919-86-2 406675-87-4

RL: CAT (Catalyst use); USES (Uses)
 (high throughput anal. of catalysts for conversion of propane to
 acrylic acid)

IT 79-10-7P, Acrylic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)
 (high throughput anal. of catalysts for conversion of propane to
 acrylic acid)

IT 74-98-6, Propane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
 (high throughput anal. of catalysts for conversion of propane to
 acrylic acid)

L38 ANSWER 4 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:319785 HCAPLUS

DN 138:323030

ED Entered STN: 25 Apr 2003

TI Ethane oxidation catalyst and process utilizing the catalyst

IN Ellis, Brian

PA BP Chemicals Limited, UK

SO PCT Int. Appl., 15 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM B01J023-68

ICS B01J023-52; C07C051-25; C07C051-215

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003033138	A1	20030424	WO 2002-GB4018	20020904 <--
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	CA 2460030	AA	20030424	CA 2002-2460030	20020904 <--
	EP 1439907	A1	20040728	EP 2002-755310	20020904 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
	BR 2002012529	A	20041019	BR 2002-12529	20020904 <--
	JP 2005505414	T2	20050224	JP 2003-535926	20020904 <--
	US 2004249204	A1	20041209	US 2004-491287	20040331 <--
PRAI	GB 2001-24835	A	20011016	<--	
	GB 2002-18870	A	20020813	<--	
	WO 2002-GB4018	W	20020904	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2003033138	ICM	B01J023-68	
	ICS	B01J023-52; C07C051-25; C07C051-215	
WO 2003033138	ECLA	B01J023/00B; B01J023/68M6; B01J023/68M4; B01J023/68R; B01J023/89G18; C07C051/215+53/08; C07C051/25+53/08; B01J023/68	<--
JP 2005505414	FTERM	4G069/AA02; 4G069/BB06A; 4G069/BB06B; 4G069/BC16A;	

4G069/BC17A; 4G069/BC17B; 4G069/BC18A; 4G069/BC21A;
 4G069/BC22A; 4G069/BC22B; 4G069/BC23A; 4G069/BC25A;
 4G069/BC25B; 4G069/BC26A; 4G069/BC26B; 4G069/BC31A;
 4G069/BC31B; 4G069/BC32A; 4G069/BC32B; 4G069/BC33A;
 4G069/BC33B; 4G069/BC54A; 4G069/BC54B; 4G069/BC55A;
 4G069/BC55B; 4G069/BC59A; 4G069/BC59B; 4G069/BC60A;
 4G069/BC64A; 4G069/BC64B; 4G069/BC66A; 4G069/BC66B;
 4G069/BC75A; 4G069/BC75B; 4G069/BD03A; 4G069/CB07;
 4G069/DA06; 4G069/EA01Y; 4G069/FA01; 4G069/FB04;
 4G069/FB30; 4G069/FB31; 4G069/FC08; 4H006/AA02;
 4H006/AC46; 4H006/BA05; 4H006/BA09; 4H006/BA11;
 4H006/BA12; 4H006/BA13; 4H006/BA14; 4H006/BA16;
 4H006/BA19; 4H006/BA26; 4H006/BA30; 4H006/BA81;
 4H006/BA82; 4H006/BC10; 4H006/BC11; 4H006/BC32;
 4H006/BS10; 4H039/CA65; 4H039/CC30

<--

US 2004249204 NCL 562/549.000
 ECLA B01J023/00B; B01J023/68; B01J023/68M4; B01J023/68M6;
 B01J023/68R; B01J023/89G18; C07C051/215+53/08;

<--

OS CASREACT 138:323030

AB A catalyst composition for the selective oxidation of ethane to HOAc and/or for the selective oxidation of ethylene to HOAc, comprises in combination with O the elements Mo, V, Nb, Au in the absence of Pd, MoaWbAucVdNbeZf where Z ≥ 1 elements selected from B, Al, Ga, In, Ge, Sn, Pb, Sb, Cu, Pt, Ag, Fe and Re; a, b, c, d, e and f = the gram atom ratios of the elements such that: $0 < a \leq 1$; $0 \leq b < 1$ and $a + b = 1$; $10^{-5} \phi_c \leq 0.02$; $0 < d \leq 2$; $0 < e \leq 1$; and $0.0001 \leq f \leq 0.05$. The catalyst Mo1.0V0.423Nb0.115Au0.008Re0.008O was applied to ethane conversion showing acetic acid selectivity 70.1% at space time yield 131.1 g/kg cat/h.

ST ethane oxidn catalyst acetic acid; ethylene oxidn catalyst acetic acid

IT Oxidation catalysts

(ethane oxidation catalyst for acetic acid manufacture)

IT 511313-28-3 511313-29-4 511313-30-7 511313-31-8

511313-32-9 511313-33-0 511313-34-1 511313-35-2

RL: CAT (Catalyst use); USES (Uses)

(ethane oxidation catalyst for acetic acid manufacture)

IT 64-19-7P, Acetic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(ethane oxidation catalyst for acetic acid manufacture)

IT 74-84-0, Ethane, reactions 74-85-1, Ethylene, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(ethane oxidation catalyst for acetic acid manufacture)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Bp Chem Int Ltd; EP 1043064 A 2000 HCAPLUS
- (2) David, J; WO 9951339 A 1999 HCAPLUS
- (3) Roesky, R; US 6274765 B1 2001 HCAPLUS
- (4) Rohm & Haas; EP 1192987 A 2002 HCAPLUS

L38 ANSWER 5 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:345937 HCAPLUS

DN 136:355590

ED Entered STN: 09 May 2002

TI Promoted multi-metal oxide catalyst for alkane oxidation

IN Bogan, Leonard Edward, Jr.

PA Rohm and Haas Company, USA

SO U.S., 9 pp.

CODEN: USXXAM

DT Patent

LA English
 IC ICM B01J023-22
 ICS B01J023-24; C07F009-94; C07F013-00
 INCL 502311000
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s) : 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6383978	B1	20020507	US 2001-928022	20010809 <--
	EP 1256381	A2	20021113	EP 2001-308712	20011012 <--
	EP 1256381	A3	20030402		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	BR 2001004630	A	20021217	BR 2001-4630	20011022 <--
	JP 2002320853	A2	20021105	JP 2001-334280	20011031 <--
	CN 1381309	A	20021127	CN 2001-137713	20011031 <--
	US 6472552	B1	20021029	US 2002-96018	20020312 <--
PRAI	US 2001-286218P	P	20010425	<--	
	US 2001-286222P	P	20010425	<--	
	US 2001-928022	A	20010809	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	US 6383978	ICM	B01J023-22
		ICS	B01J023-24; C07F009-94; C07F013-00
		INCL	502311000
	US 6383978	NCL	502/311.000; 502/309.000; 502/310.000; 502/312.000; 502/322.000; 556/042.000; 556/047.000
		ECLA	B01J023/00B; B01J023/22; B01J023/28; B01J027/057T; C07C051/215+57/04; C07C253/24
	EP 1256381	ECLA	B01J023/00B; B01J023/22; B01J023/28; B01J027/057T; C07C051/215+57/04; C07C253/24
	US 6472552	NCL	558/319.000; 502/511.000; 562/549.000
		ECLA	B01J023/00B; B01J023/22; B01J023/28; B01J027/057T; C07C051/215+57/04; C07C253/24

AB A promoted multi-metal oxide catalyst is useful for the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, to an unsatd. carboxylic acid and for the vapor phase ammoxidn. of an alkane, or a mixture of an alkane and an alkene, to an unsatd. nitrile. Ammonium heptamolybdate (51.35 g), ammonium metavanadate (10.11 g) and telluric acid (15.36 g) were dissolved in warm water, oxalic acid dihydrate (5.68 g) was dissolved in a 6.5% solution of niobium oxalate in water (249.55 g), and the resulting niobium oxalate solution was added to the first solution, after stirring 15 min, the mixture was dried in a rotary evaporator, overnight under vacuum, and calcined 1 h at 275° in air and 2 h at 600° in Ar.

ST metal oxide promoted oxidn catalyst alkane; ammoxidn catalyst alkane metal oxide; molybdenum vanadium mixed metal oxide

IT Oxidation catalysts
 (promoted mixed metal oxide catalyst for alkane oxidation to unsatd. carboxylic acid)

IT Ammoxidation catalysts
 (promoted mixed metal oxide catalyst for alkane oxidation to unsatd. nitrile)

IT 74-98-6, Propane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (oxidation; promoted mixed metal oxide catalyst for alkane oxidation to unsatd. nitrile)

IT 149920-40-1, Bismuth molybdenum niobium tellurium vanadium oxide

420134-66-3

RL: CAT (Catalyst use); USES (Uses)
 (promoted mixed metal oxide catalyst for alkane oxidation to unsatd.
 nitrile)

IT 79-10-7P, Acrylic Acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)
 (promoted mixed metal oxide catalyst for alkane oxidation to unsatd.
 nitrile)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Anon; EP 0630879 B1 1994 HCPLUS
- (2) Anon; JP 753448 1995
- (3) Cirjak; US 6043185 A 2000 HCPLUS
- (4) Hatano; US 5049692 A 1991 HCPLUS
- (5) Martin; US 5569636 A 1996 HCPLUS
- (6) Martin; US 5583084 A 1996 HCPLUS
- (7) Ushikubo; US 5231214 A 1993 HCPLUS
- (8) Ushikubo; US 5281745 A 1994 HCPLUS
- (9) Ushikubo; US 5380933 A 1995 HCPLUS

L38 ANSWER 6 OF 20 HCPLUS COPYRIGHT 2005 ACS on STN

AN 2002:77444 HCPLUS

DN 136:118213

ED Entered STN: 29 Jan 2002

TI Preparation of unsaturated carboxylic acids

IN Koyasu, Yukio; Yoshikawa, Yumiko

PA Mitsubishi Chemical Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C07C051-25

ICS B01J023-28; C07C057-05; C07B061-00

CC 23-16 (Aliphatic Compounds)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2002030028	A2	20020129	JP 2000-212126	20000713 <--
PRAI JP 2000-212126			20000713	<--

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 2002030028	ICM	C07C051-25
	ICS	B01J023-28; C07C057-05; C07B061-00

OS CASREACT 136:118213

AB Title compds. are prepared by gas-phase oxidation of olefins in the presence of mixed oxide catalysts containing Mo, V, and Sb. A mixture of propylene, O₂, and H₂O was fed into a reactor containing Mo₁V_{0.23}Nb_{0.1}Sb_{0.13}O_n (prepared from ammonium paramolybdate, Sb₂O₃, ammonium metavanadate, Nb₂O₅) at 400° and SV 3600 h⁻¹ to give 67.8% acrylic acid.

ST unsatd carboxylic acid prepns; acrylic acid prepns; olefin oxidn molybdenum vanadium antimony oxide catalyst

IT Oxidation catalysts
 (preparation of unsatd. carboxylic acids)

IT Alkenes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of unsatd. carboxylic acids)

IT Carboxylic acids, preparation
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
 (Preparation)

(unsatd.; preparation of unsatd. carboxylic acids)
 IT 193405-60-6, Antimony molybdenum niobium vanadium oxide 202523-10-2,
 Antimony molybdenum titanium vanadium oxide 204920-27-4,
 Antimony cerium molybdenum niobium vanadium oxide 390750-04-6
 RL: CAT (Catalyst use); USES (Uses)
 (preparation of unsatd. carboxylic acids)
 IT 79-10-7P, Acrylic acid, preparation
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
 (Preparation)
 (preparation of unsatd. carboxylic acids)
 IT 115-07-1, Propylene, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of unsatd. carboxylic acids)

L38 ANSWER 7 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:733932 HCAPLUS

DN 135:278674

ED Entered STN: 09 Oct 2001

TI Catalyst for oxidation or ammoxidation

IN Komata, Satoru; Fukushima, Satoshi; Nagano, Osamu

PA Asahi Chemical Industry Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM B01J023-28

ICS B01J023-34; B01J023-88; B01J027-057; C07C051-215; C07C057-05;
 C07C253-24; C07C255-08; C07B061-00

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2001276618	A2	20011009	JP 2000-101415	20000403 <--
PRAI JP 2000-101415			20000403	<--

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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JP 2001276618	ICM	B01J023-28
	ICS	B01J023-34; B01J023-88; B01J027-057; C07C051-215; C07C057-05; C07C253-24; C07C255-08; C07B061-00

AB The catalyst is used for the oxidation of propane and isobutane to form unsatd. acid nitrile. The catalyst can be represented by MoVaNbbBcXdOn (X = Sb; Te; $0.1 \leq a \leq 1$; $0.01 \leq b \leq 1$; $0.1 \leq c \leq 3$; $0.01 \leq d \leq 1$; and n = integer). The catalyst showed high selectivity and wear resistance.

ST oxidn ammoxidn catalyst

IT Ammoxidation catalysts

Oxidation catalysts

(catalyst for oxidation or ammoxidn.)

IT 7631-86-9, Silica, uses 221394-85-0, Boron molybdenum niobium vanadium oxide 363610-76-8 363610-77-9 363610-78-0

RL: CAT (Catalyst use); USES (Uses)

(catalyst for oxidation or ammoxidn.)

IT 74-98-6, Propane, uses 75-28-5, Isobutane

RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(catalyst for oxidation or ammoxidn.)

L38 ANSWER 8 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:631571 HCAPLUS

DN 133:223163
 ED Entered STN: 12 Sep 2000
 TI Metal oxide catalysts, their preparation, and manufacture of acrylic acid with them
 IN Takahashi, Mamoru; Tu, Xin Lin; Niizuma, Hiroshi
 PA Toa Gosei Chemical Industry Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM B01J023-68

ICS B01J023-28; B01J023-88; B01J023-89; C07B061-00; C07C051-21;
 C07C057-055

CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 23, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000246108	A2	20000912	JP 1999-52708	19990301 <--
PRAI	JP 1999-52708		19990301	<--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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JP 2000246108	ICM	B01J023-68
	ICS	B01J023-28; B01J023-88; B01J023-89; C07B061-00; C07C051-21; C07C057-055

AB The catalysts comprise Mo, V, Sb, A, (A is ≥1 elements selected from Nb and Ta), B (B is ≥1 elements selected from Ag, Zn, Sn, Pb, As, Cu, Tl, and Se). Ammonium metavanadate was reacted with Sb₂O₃, ammonium molybdate, and selenic acid in H₂O under reflux for 16 h, mixed with niobic acid in the presence of H₂O₂, oxalic acid, and NH₃, burned at 580° for 5 h to give a catalysts with Mo:V:Sb:Nb:Se ratios of 1.0:0.3:0.23:0.08:0.008. Oxidation of propane with O in the presence of the catalyst gave 32.1% acrylic acid.

ST metal oxide catalyst oxidn propane; acrylic acid prepn

IT Oxidation catalysts

(manufacture of metal oxide catalysts and acrylic acid with them)

IT 292139-84-5 292139-85-6 292139-86-7

RL: CAT (Catalyst use); USES (Uses)

(manufacture of metal oxide catalysts and acrylic acid with them)

IT 79-10-7P, Acrylic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(manufacture of metal oxide catalysts and acrylic acid with them)

IT 74-98-6, Propane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(manufacture of metal oxide catalysts and acrylic acid with them)

L38 ANSWER 9 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:564783 HCAPLUS

DN 133:335477

ED Entered STN: 16 Aug 2000

TI Selective oxidation of light alkanes over hydrothermally synthesized Mo-V-M-O (M = Al, Ga, Bi, Sb, and Te) oxide catalysts

AU Ueda, W.; Oshihara, K.

CS Department of Materials Science and Engineering, Science University of Tokyo in Yamaguchi, Yamaguchi, 765-0884, Japan

SO Applied Catalysis, A: General (2000), 200(1-2), 135-143

CODEN: ACAGE4; ISSN: 0926-860X

PB Elsevier Science B.V.

DT Journal

LA English
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 37, 67
 AB Selective oxidns. of ethane to ethene and acetic acid and of propane to acrylic acid were carried out over hydrothermally synthesized Mo-V-M-O (M = Al, Ga, Bi, Sb, and Te) complex metal oxide catalysts. All the synthesized solids were rod-shaped crystallites and gave a common XRD peak corresponding to 4.0 Å d-spacing. From the different XRD patterns at low angle region below 10° and from the different shape of the cross-section of the rod crystal obtained by SEM, the solids were classified into two groups: Mo-V-M-O (M = Al, possibly Ga and Bi) and Mo-V-M-O (M=Sb, and Te). The former catalyst was moderately active for the ethane oxidation to ethene and to acetic acid. On the other hand the latter was found to be extremely active for the oxidative dehydrogenation. The Mo-V-M-O (M = Sb, and Te) catalysts were also active for the propane oxidation to acrylic acid. It was found that the grinding of the catalysts after heat-treatment at 600°C in N₂ increased the conversions of propane and enhanced the selectivity to acrylic acid. Structural arrangement of the catalytic functional components on the surface of the cross-section of the rod-shaped catalysts seems to be important for the oxidation activity and selectivity.
 ST selective oxidn ethane propane metal oxide catalyst
 IT Rare earth metals, uses
 RL: CAT (Catalyst use); USES (Uses)
 (complexes with other metals; selective oxidation of light alkanes over hydrothermally synthesized metal oxide catalysts)
 IT Oxidation
 Oxidation catalysts
 (selective; selective oxidation of light alkanes over hydrothermally synthesized metal oxide catalysts)
 IT 7440-05-3, Palladium, uses 7440-62-2, Vanadium, uses 7631-86-9, Silica, uses 11075-35-7, Titanium vanadium oxide 12673-88-0, Molybdenum tin oxide 13463-67-7, Titania, uses 50813-81-5, Bismuth molybdenum vanadium oxide 51931-41-0, Antimony molybdenum oxide phosphate 55521-81-8, Antimony molybdenum vanadium oxide 58834-75-6 61164-11-2, Vanadium oxide phosphate 128177-24-2, Molybdenum tantalum vanadium oxide phosphate 128220-99-5, Cesium iron molybdenum vanadium oxide phosphate 130040-37-8, Vanadium zirconium oxide phosphate 133854-68-9 145054-98-4, Molybdenum niobium vanadium oxide 146569-47-3, Molybdenum tellurium vanadium oxide 146569-48-4, Molybdenum niobium tellurium vanadium oxide 152991-86-1, Molybdenum oxide phosphate 156166-12-0, Molybdenum vanadium oxide phosphate 193405-60-6, Antimony molybdenum niobium vanadium oxide 202708-41-6 210712-03-1, Bismuth molybdenum nickel oxide 222853-44-3, Aluminum molybdenum vanadium oxide 304017-47-8, Gallium molybdenum vanadium oxide 304017-48-9 304017-49-0, Phosphorus tellurium vanadium oxide 304017-50-3
 RL: CAT (Catalyst use); USES (Uses)
 (selective oxidation of light alkanes over hydrothermally synthesized metal oxide catalysts)
 IT 74-84-0, Ethane, reactions 74-98-6, Propane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (selective oxidation of light alkanes over hydrothermally synthesized metal oxide catalysts)
 IT 64-19-7P, Acetic acid, preparation 74-85-1P, Ethene, preparation 79-10-7P, Acrylic acid, preparation 124-38-9P, Carbon dioxide, preparation 630-08-0P, Carbon monoxide, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (selective oxidation of light alkanes over hydrothermally synthesized metal oxide catalysts)

RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L38 ANSWER 10 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:201111 HCAPLUS

DN 132:237515

ED Entered STN: 29 Mar 2000

TI Gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidation

IN Cirjak, Larry M.; Venturelli, Anne; Cassidy, Timothy J.; Pepera, Marc A.; Drenski, Tama L.

PA The Standard Oil Company, USA

SO U.S., 6 pp.

CODEN: USXXAM

DT Patent

LA English

IC ICM B01J023-00

 ICS C07C253-00

INCL 502311000

CC 35-2 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 23, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6043185	A	20000328	US 1999-285384	19990402 <--
	WO 2000059869	A1	20001012	WO 2000-US4620	20000223 <--
	W: BG, BR, CA, CN, IN, JP, KR, RO, RU, SG, TR, ZA				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,				
	PT, SE				
PRAI	US 1999-285384	A	19990402	<--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 6043185	ICM	B01J023-00
	ICS	C07C253-00
	INCL	502311000
US 6043185	NCL	502/311.000; 502/312.000; 558/321.000; 558/323.000; 558/325.000
	ECLA	B01J023/08; B01J023/18; B01J023/28; C07C253/24
WO 2000059869	ECLA	B01J023/08; B01J023/18; B01J023/28; C07C253/24
AB A catalyst composition useful in the manufacture of acrylonitrile/methacrylonitrile by the vapor phase reaction of propane/isobutane with O and NH ₃ , wherein paraffin:NH ₃ :O = 1.0:10:10 mol ratio, comprises MO _a VbSbcGadXeO _x (X = As, Te, Se, Nb, Ta, W, Ti, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pd, Pt, B, In, Ce, Re, Ir, Ge, Sn, Bi, Y, Pr, an alkali metal, and an alkaline earth metal, Nb, Ce, Fe, Ge, Sn, In, As, Se, and B, especially preferred being Nb; a = 1; b = 0.0-0.99; c = 0.01-0.9; d = 0.01-0.5; e = 0.01-1.0; x is determined by the oxidation state of the cations present). Thus, a catalyst composition Mo _{1.0} V _{0.3} Sb _{0.15} Nb _{0.05} Ga _{0.03} O _x was prepared by heating a mix. comprising 17.33 NH ₄ VO ₃ , 10.79 Sb ₂ O ₃ , 86.17 (NH ₄) ₆ Mo ₇ O ₂₄ , 15.62 Nb oxalate, and 1.39 g Ga ₂ O ₃ and tested with feed ratio propane/NH ₃ /O/N/H ₂ O 1.0/1.4/3.3/12.3/4.0 at 460°.		
ST	gallium molybdenum vanadium antimony oxide catalyst; metal oxide catalyst ammoxidn; acrylonitrile methacrylonitrile manuf catalyst	
IT	Reactors	
	Reactors (fluidized-bed; gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidn.)	
IT	Ammoxidation catalysts (gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidn.)	
IT	Alkali metals, uses	
	Alkaline earth metals	
	RL: CAT (Catalyst use); USES (Uses)	(gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidn.)
IT	Fluidized beds	
	Fluidized beds (reactors; gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidn.)	
IT	7803-55-6	12024-21-4, Gallium oxide (Ga ₂ O ₃) 12027-67-7 21348-59-4, Niobium oxalate
	RL: CAT (Catalyst use); USES (Uses)	(gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidn.)
IT	261919-86-2	RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
	(gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidn.)	
IT	107-13-1P, Acrylonitrile, preparation	126-98-7P, Methacrylonitrile
	RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)	(gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidn.)
IT	74-98-6, Propane, reactions	75-28-5, Isobutane 115-07-1, Propylene, reactions
	7664-41-7, Ammonia, reactions	7782-44-7, Oxygen, reactions
	RL: RCT (Reactant); RACT (Reactant or reagent)	(gallium promoted molybdenum vanadium-antimony-oxide based catalyst for

selective paraffin ammonidin.)

RE.CNT 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Anon; DE 19835247 1999 HCAPLUS

L38 ANSWER 11 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2000:169369 HCAPLUS
 DN 132:208269
 ED Entered STN: 15 Mar 2000
 TI Highly active and selective catalysts for the production of unsaturated nitriles, methods of making and using the same
 IN Abdulwahed, Mazhar; El Yahyaoui, Khalid
 PA Saudi Basic Industries Corporation, Saudi Arabia
 SO U.S., 6 pp.
 CODEN: USXXAM
 DT Patent
 LA English
 IC ICM B01J023-00
 ICS B01J023-32; B01J023-02; B01J023-16
 INCL 502300000
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 67

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6037304	A	20000314	US 1999-228885	19990111 <--
	US 6124233	A	20000926	US 1999-431744	19991101 <--
	EP 1020433	A2	20000719	EP 2000-200009	20000105 <--
	EP 1020433	A3	20000816		
	EP 1020433	B1	20040407		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2000229929	A2	20000822	JP 2000-2312	20000111 <--
	US 6486091	B1	20021126	US 2000-675599	20000929 <--
PRAI	US 1999-228885	A3	19990111	<--	
	US 1999-431744	A	19991101	<--	
	US 2000-189215P	P	20000314	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	US 6037304	ICM	B01J023-00
		ICS	B01J023-32; B01J023-02; B01J023-16
		INCL	502300000
	US 6037304	NCL	502/300.000; 502/305.000; 502/306.000; 502/312.000; 502/313.000; 502/319.000; 502/321.000; 502/324.000; 502/325.000; 502/340.000; 502/353.000
		ECLA	B01J023/00B; B01J023/31; C07C253/26
	US 6124233	NCL	502/312.000; 558/321.000; 558/324.000
		ECLA	B01J023/00B; B01J023/31; C07C253/26
	EP 1020433	ECLA	B01J023/00B; B01J023/31; C07C253/26
	US 6486091	NCL	502/312.000; 502/311.000; 502/321.000; 502/353.000
		ECLA	B01J023/31; C07C253/26

AB A catalyst system comprises a catalyst having the empirical formula of Bi_aMo_bV_c Sb_dNb_eAl_fB_gO_x (A = ≥1 element from groups VB, VIB, VIIIB, VIII of the periodic table; B = ≥1 alkali, alkaline earth metal promoter selected from groups IA, IIA; a, b = 0.01-12; c = 0.01-2; d = 0.01-10; f = 0-1; g = 0-0.5; x = number of O required to satisfy the valency requirement of the elements present). Thus, an ammonidin. catalyst of Bi_{0.1}Mo_{0.1}V_{0.175}Sb_{0.35}O_x/50% SiO₂ was prepared for conversion of propylene to acrylonitrile.

ST ammoxidn catalyst niobium pentaoxide coversion propylene; vanadium molybdenum antimony niobium oxide catalyst; silica supported ammoxidn catalyst

IT Aluminates
 Borates
 Carbonates, uses
 Pumice
 Silicates, uses
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst support; highly active and selective catalysts for the production of unsatd. nitriles, methods of making and using the same)

IT Ammoxidation catalysts
 (highly active and selective catalysts for the production of unsatd. nitriles, methods of making and using the same)

IT Phosphates, uses
 RL: CAT (Catalyst use); USES (Uses)
 (inorg., catalyst support; highly active and selective catalysts for the production of unsatd. nitriles, methods of making and using the same)

IT 409-21-2, Silicon carbide, uses 1314-23-4, Zirconia, uses 1318-93-0, Montmorillonite, uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 13463-67-7, Titania, uses 159995-97-8, Aluminum silicon oxide
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst support; highly active and selective catalysts for the production of unsatd. nitriles, methods of making and using the same)

IT 1313-96-8, Niobium pentoxide 260557-95-7
 RL: CAT (Catalyst use); USES (Uses)
 (highly active and selective catalysts for the production of unsatd. nitriles, methods of making and using the same)

IT 107-13-1P, Acrylonitrile, preparation 126-98-7P, Methacrylonitrile
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (highly active and selective catalysts for the production of unsatd. nitriles, methods of making and using the same)

IT 115-07-1, Propylene, reactions 115-11-7, Isobutylene, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (highly active and selective catalysts for the production of unsatd. nitriles, methods of making and using the same)

RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Anon; EP 0294845 A1 1988 HCAPLUS
- (3) Anon; EP 0407091 A1 1991 HCAPLUS
- (4) Anon; EP 0475351 A1 1992 HCAPLUS
- (5) Anon; EP 0480594 A2 1992 HCAPLUS
- (6) Anon; EP 0518548 A2 1992 HCAPLUS
- (7) Anon; EP 0573713 B1 1993 HCAPLUS
- (8) Anon; EP 0620205 A1 1994 HCAPLUS
- (9) Anon; EP 0627401 A1 1994 HCAPLUS
- (10) Aoki; US 4600541 1986 HCAPLUS
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- (14) Decker; US 4339355 1982 HCAPLUS
- (15) Drenski; US 5688739 1997 HCAPLUS
- (16) Ebner; US 4405498 1983 HCAPLUS
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- (19) Manyik; US 4596787 1986 HCAPLUS
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- (21) McCain; US 4524236 1985 HCAPLUS
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- (23) McCain; US 5162578 1992 HCPLUS
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L38 ANSWER 12 OF 20 HCPLUS COPYRIGHT 2005 ACS on STN
 AN 1998:352802 HCPLUS
 DN 129:28336
 ED Entered STN: 11 Jun 1998
 TI Process for simultaneous preparation of acrylonitrile and acrylic acid
 IN Kayou, Atsushi; Ihara, Tatsuya
 PA Mitsubishi Chemical Corp., Japan
 SO PCT Int. Appl., 29 pp.
 CODEN: PIXXD2
 DT Patent
 LA Japanese
 IC ICM C07C057-05
 ICS C07C255-08; C07C253-24
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 23, 67
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9822421	A1	19980528	WO 1997-JP4169	19971117 <--
	W: AU, CA, CN, ID, JP, KR, SG, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	CA 2271421	AA	19980528	CA 1997-2271421	19971117 <--
	AU 9749661	A1	19980610	AU 1997-49661	19971117 <--
	EP 970942	A1	20000112	EP 1997-912475	19971117 <--
	EP 970942	B1	20040303		
	R: DE, GB				
	US 6166241	A	20001226	US 1999-284993	19990513 <--
PRAI	JP 1996-304502	A	19961115	<--	
	WO 1997-JP4169	W	19971117	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES	
	WO 9822421	ICM	C07C057-05	
		ICS	C07C255-08; C07C253-24	
	WO 9822421	ECLA	C07C051/215+57/04; C07C253/24	<--
	EP 970942	ECLA	C07C051/215+57/04; C07C253/24	<--
	US 6166241	NCL	558/318.000; 562/549.000	
		ECLA	C07C051/215+57/04; C07C253/24	<--

AB A process for simultaneous preparation of acrylonitrile (I) and acrylic acid (II) by gas-phase catalytic oxidation of propane with ammonia and oxygen in the presence of a metal oxide catalyst containing as the essential components V and ≥ 1 element selected among Te, Sb and Mo is characterized by regulating both the molar ratio of propane to ammonia and that of oxygen to ammonia each within the range of 2-10. Conducting the ammoxidn. of propane at the selected molar ratios of propane to ammonia and oxygen to ammonia enables the simultaneous preparation of I and II at a high total selectivity and in a high total yield. Further, the catalytic activity can be retained for a long period, so that the ammoxidn. can be conducted efficiently and stably for a long period.

ST ammoxidn propane acrylonitrile prepn; acrylic acid prepn oxidn propane; gas phase oxidn catalyst propane; vanadium tellurium antimony molybdenum

oxide catalyst
 IT Ammoxidation
 Ammoxidation catalysts
 Oxidation
 Oxidation catalysts
 (simultaneous preparation of acrylonitrile and acrylic acid by gas-phase catalytic oxidation of propane)
 IT 146569-48-4 146569-65-5
 RL: CAT (Catalyst use); USES (Uses)
 (simultaneous preparation of acrylonitrile and acrylic acid by gas-phase catalytic oxidation of propane)
 IT 79-10-7P, Acrylic acid, preparation 107-13-1P, Acrylonitrile,
 preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (simultaneous preparation of acrylonitrile and acrylic acid by gas-phase catalytic oxidation of propane)
 IT 74-98-6, Propane, reactions 7664-41-7, Ammonia, reactions 7782-44-7,
 Oxygen, reactions
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC
 (Process); RACT (Reactant or reagent)
 (simultaneous preparation of acrylonitrile and acrylic acid by gas-phase catalytic oxidation of propane).

RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Mitsubishi Chemical Corp; EP 608838 A2 1995 HCPLUS
- (3) Mitsubishi Chemical Corp; JP 710801 A 1995
- (4) Mitsubishi Chemical Corp; JP 08225506 A 1996 HCPLUS
- (5) Mitsubishi Chemical Corp; JP 857319 A 1996
- (6) Mitsubishi Chemical Corp; JP 09157241 A 1997 HCPLUS
- (7) Mitsubishi Chemical Corp; EP 767164 A1 1997 HCPLUS
- (8) Mitsubishi Chemical Industries Ltd; JP 05148212 A 1993 HCPLUS
- (9) Mitsubishi Chemical Industries Ltd; JP 05279313 A 1993 HCPLUS
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- (11) Mitsubishi Chemical Industries Ltd; CN 1069723 A 1993 HCPLUS
- (12) Mitsubishi Chemical Industries Ltd; TW 217993 A 1993
- (13) Mitsubishi Chemical Industries Ltd; TW 218008 A 1993
- (14) Mitsubishi Chemical Industries Ltd; EP 512846 A1 1993 HCPLUS
- (15) Mitsubishi Chemical Industries Ltd; US 5231214 A 1993 HCPLUS
- (16) Mitsubishi Chemical Industries Ltd; US 5281745 A 1993 HCPLUS
- (17) Mitsubishi Chemical Industries Ltd; EP 529853 A2 1993 HCPLUS
- (18) Mitsubishi Chemical Industries Ltd; BR 9201749 A 1993 HCPLUS
- (19) Mitsubishi Chemical Industries Ltd; BR 9203080 A 1993 HCPLUS
- (20) Mitsui Toatsu Chemicals Inc; JP 05213848 A 1993 HCPLUS
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- (22) The Standard Oil Co; JP 01268668 A 1989 HCPLUS
- (23) The Standard Oil Co; CN 1036913 A 1989
- (24) The Standard Oil Co; CN 1061731 A 1989 HCPLUS
- (25) The Standard Oil Co; EP 337028 A1 1989 HCPLUS
- (26) The Standard Oil Co; US 4788317 A 1989 HCPLUS
- (27) The Standard Oil Co; BR 8801868 A 1989 HCPLUS
- (28) The Standard Oil Co; JP 05293374 A 1993 HCPLUS
- (29) The Standard Oil Co; CN 1063240 A 1993 HCPLUS
- (30) The Standard Oil Co; CA 2056923 A 1993 HCPLUS
- (31) The Standard Oil Co; TW 206926 A 1993
- (32) The Standard Oil Co; EP 492805 A1 1993 HCPLUS
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- (34) The Standard Oil Co; BR 9105578 A 1993 HCPLUS
- (35) The Standard Oil Co; JP 09104666 A 1997 HCPLUS
- (36) The Standard Oil Co; SG 43371 A1 1997

- (37) The Standard Oil Co; US 5576469 A 1997 HCAPLUS
- (38) The Standard Oil Co; EP 747349 A1 1997 HCAPLUS
- (39) The Standard Oil Co; ZA 9604551 A 1997 HCAPLUS
- (40) The Standard Oil Co; KR 97001312 A 1997
- (41) Toa Gosei Co Ltd; JP 09316023 A 1997 HCAPLUS

L38 ANSWER 13 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1998:197888 HCAPLUS
 DN 128:244499
 ED Entered STN: 06 Apr 1998
 TI Manufacture of α,β -unsaturated nitriles from alkanes and ammonia at high selectivity
 IN Ushikubo, Takashi; Oshima, Kazunori; Ihara, Tatsuya; Kayo, Atsushi; Sawaki, Itaru
 PA Mitsubishi Chemical Industries Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C07C255-08
 ICS B01J023-28; B01J027-057; C07C253-24; C07B061-00
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 45

FAN.CNT 1	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	-----	-----	-----	-----
PI	JP 10081660	A2	19980331	JP 1996-255338	19960906 <--
PRAI	JP 1996-255338		19960906	<--	

CLASS	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	-----	-----	-----
	JP 10081660	ICM	C07C255-08
		ICS	B01J023-28; B01J027-057; C07C253-24; C07B061-00
AB	The α,β -unsatd. nitriles are manufactured by catalytic gas-phase oxidation of C3-8 alkanes with NH ₃ in the presence of metal oxide catalysts, where the gas component molar ratio C3-8 alkane/NH ₃ /O ₂ /dilute gas is . The process for α,β -unsatd. nitriles comprises supplying gas mixture of C3-8 alkane/NH ₃ /O ₂ /dilute with mole ratio 1/0.01-0.9/0.1-1.8/0-9 to a reactor having metal oxide catalyst; separating the nitriles from gaseous reaction products flowing out of the reactors; separating and recovering unreacted alkanes-containing gas; and feeding the recycled gas into the reactor. Thus, a mixture of 1/0.4/0.8/3.2 propane/NH ₃ /O ₂ /N ₂ (propane content 18.5 vol%) was supplied into a reactor filled SiO ₂ -supported Mo ₁ V _{0.3} Te _{0.23} Nb _{0.12} On catalyst 100 mg and reacted at 420° to give 18.9% acrylonitrile in catalytic selectivity 65.3% (in propane conversion 28.9%).		
ST	unsatd nitrile manuf selectivity; metal oxide catalyst alkane ammonia oxidn; propane ammonia gas phase catalytic oxidn; acrylonitrile manuf gas phase catalytic oxidn		
IT	Alkanes, reactions RL: RCT (Reactant); RACT (Reactant or reagent) (C3-8; manufacture of α,β -unsatd. nitriles at high selectivity by gas-phase oxidation of alkanes and ammonia in the presence of metal oxides)		
IT	Oxidation (gas-phase; manufacture of α,β -unsatd. nitriles at high selectivity by gas-phase oxidation of alkanes and ammonia in the presence of metal oxides)		
IT	Oxidation catalysts (manufacture of α,β -unsatd. nitriles at high selectivity by		

gas-phase oxidation of alkanes and ammonia in the presence of metal oxides)

IT Nitriles, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (α, β -unsatd.; manufacture of α, β -unsatd. nitriles at high selectivity by gas-phase oxidation of alkanes and ammonia in the presence of metal oxides)

IT 7631-86-9, Silica, uses
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst support; manufacture of α, β -unsatd. nitriles at high selectivity by gas-phase oxidation of alkanes and ammonia in the presence of metal oxides)

IT 146569-48-4, Molybdenum niobium tellurium vanadium oxide
 204920-27-4
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst; manufacture of α, β -unsatd. nitriles at high selectivity by gas-phase oxidation of alkanes and ammonia in the presence of metal oxides)

IT 1309-64-4, Antimony trioxide, reactions 7803-55-6, Ammonium metavanadate
 11120-48-2, Telluric acid 12027-67-7, Ammonium paramolybdate
 37382-23-3, Cerium hydroxide 60086-69-3
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (in preparation of catalysts for gas-phase oxidation of alkanes)

IT 107-13-1P, Acrylonitrile, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (manufacture of α, β -unsatd. nitriles at high selectivity by gas-phase oxidation of alkanes and ammonia in the presence of metal oxides)

IT 74-98-6, Propane, reactions 75-28-5, Isobutane 7664-41-7, Ammonia, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of α, β -unsatd. nitriles at high selectivity by gas-phase oxidation of alkanes and ammonia in the presence of metal oxides)

L38 ANSWER 14 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1998:93332 HCAPLUS
 DN 128:155780
 ED Entered STN: 18 Feb 1998
 TI Oxidative conversion of LPG to olefins with mixed oxide catalysts: surface chemistry and reactions network
 AU Landau, M. V.; Kaliya, M. L.; Gutman, A.; Kogan, L. O.; Herskowitz, M.; Van Den Oosterkamp, P. F.
 CS Blechner Center for Industrial Catalysis and Process Development, Ben-Gurion University of the Negev, Beer Sheva, 84105, Israel
 SO Studies in Surface Science and Catalysis (1997), 110(3rd World Congress on Oxidation Catalysis, 1997), 315-326
 CODEN: SSCTDM; ISSN: 0167-2991
 PB Elsevier Science B.V.
 DT Journal
 LA English
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 51
 AB The catalytic performance of 3 mixed oxide catalytic systems V-Mo-, V-Mg and RE-Li-Halogen (RLH) in LPG oxidative conversion was measured at different O/LPG ratios, temps. and WHSV. At high LPG conversions V-Mo-based catalysts yielded low olefins selectivity and high LPG combustion (CB), V-Mg - medium olefins selectivity by oxidative dehydrogenation (ODH) route and medium LPG CB selectivity, while RLH catalysts displayed high olefins selectivity by ODH and cracking (CR)

routes at low CB. TP-reaction expts. and the effects of O partial pressure on catalytic performance indicated a dynamic interaction of surface O in the ODH, CB and CR routes. ESCA and TPD measurements detected three types of surface O with different nucleophilicity and bonding strength. Their distribution correlated with LPG conversion selectivities. A correlation between catalysts acidity, the surface exposed metal cations concentration and the productivity by the CR route was derived. The surface basicity was also significant in olefins productivity by the ODH and CR routes. The selectivity of LPG oxidative reactions were attributed to different intermediates formed on the surface as a result of interaction of C3-C4 paraffins with O atoms of different nucleophilicity. Both the redox balance of surface metal cations and the acidity-basicity balance are proposed to be significant.

ST mixed oxide catalyst oxidn LPG olefin
 IT Petroleum products
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (gases, liquefied; surface chemical and reactions network in oxidative conversion of LPG to olefins with mixed oxide catalysts)
 IT Oxides (inorganic), processes
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (mixed; surface chemical and reactions network in oxidative conversion of LPG to olefins with mixed oxide catalysts)
 IT Oxidation
 Oxidation catalysts
 (surface chemical and reactions network in oxidative conversion of LPG to olefins with mixed oxide catalysts)
 IT Alkenes, preparation
 RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
 (surface chemical and reactions network in oxidative conversion of LPG to olefins with mixed oxide catalysts)
 IT 12209-58-4, Molybdenum vanadium oxide 37359-32-3, Magnesium vanadium oxide 39406-99-0, Lithium magnesium vanadium oxide 202708-41-6
 202708-42-7, Calcium molybdenum vanadium oxide 202708-45-0, Magnesium sulfur vanadium oxide 202708-46-1 202708-48-3 202708-49-4
 202708-50-7, Cerium lithium magnesium chloride oxide 202708-51-8
 202708-52-9, Dysprosium lithium magnesium oxide 202708-53-0
 202708-54-1
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (surface chemical and reactions network in oxidative conversion of LPG to olefins with mixed oxide catalysts)
 RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE
 (1) Albonetti, S; Catal Rev-Sci Eng 1996, P413 HCPLUS
 (2) Bielanski, A; Oxygen in Catalysis 1991
 (3) Cavani, F; Catal Today 1995, V24, P307 HCPLUS
 (4) Centi, G; Chem Rev 1988, V88, P55 HCPLUS
 (5) Conway, C; Appl Catal 1991, V79, PL1
 (6) Fugle, J; Surf Sci 1975, V49, P61 HCPLUS
 (7) Ito, T; J Amer Chem Soc 1985, V107, P5062 HCPLUS
 (8) Kung, H; US 4777319 1988 HCPLUS
 (9) Kung, H; Adv in Catal 1994, V40, P1 HCPLUS
 (10) Kung, H; Ind Eng Chem Prod Res Dev 1986, V25, P171 HCPLUS
 (11) Landau, M; CHEMTECH 1996, V26(2), P24 HCPLUS
 (12) Mars, P; Chem Eng Sci (Special Suppl) 1954, V3, P41 HCPLUS
 (13) McCain, J; US 4524236 1985 HCPLUS
 (14) Peng, X; J Catal 1990, V121, P99 HCPLUS

(15) Sokolovskii, V; Catal Rev-Sci Eng 1990, V32(1&2), P1
 (16) Wang, D; J Catal 1995, V151, P155 HCAPLUS
 (17) Ziolkowski, J; J Catal 1983, V81, P298 HCAPLUS

L38 ANSWER 15 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1998:81020 HCAPLUS
 DN 128:209443
 ED Entered STN: 12 Feb 1998
 TI Manufacture of catalyst for catalytic oxidation of hydrocarbons
 IN Ushikubo, Takashi; Oshima, Kazusuke; Ogoshi, Toru; Numasawa, Satomi;
 Kinoshita, Hisao; Watanabe, Akira
 PA Mitsubishi Chemical Industries Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 9 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM B01J023-28
 ICS B01J023-30; B01J023-34; B01J023-64; B01J023-88; B01J027-057;
 B01J027-199; C07B061-00; C07C253-24; C07C255-08
 CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 45
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 10028862	A2	19980203	JP 1997-89569	19970408 <--
PRAI JP 1996-96578	A	19960418		<--

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 10028862	ICM B01J023-28 ICS B01J023-30; B01J023-34; B01J023-64; B01J023-88; B01J027-057; B01J027-199; C07B061-00; C07C253-24; C07C255-08	

AB The catalysts for the catalytic oxidation of hydrocarbons, are prepared by impregnating a solution containing W, Mo, Cr, Zr, etc., onto the composite metal oxide represented by an empirical formula $M_{a}V_{b}X_{x}Z_{z}O_n$ [X = Te and Sb; Z = Nb, Ta, W, Ti, etc.; b/a = 0.01-1, x/a = 0.01-1, z/a = 0-1].
 ST catalyst catalytic oxidn hydrocarbon ammoxidn; molybdenum niobium tellurium tungsten vanadium oxide; phosphorus silicon cerium catalyst propane acrylonitrile; ammoxidn catalyst propane acrylonitrile
 IT Ammoxidation
 Ammoxidation catalysts
 (manufacture of catalyst for catalytic oxidation of hydrocarbon)
 IT Oxides (inorganic), uses
 RL: CAT (Catalyst use); USES (Uses)
 (manufacture of catalyst for catalytic oxidation of hydrocarbon)
 IT Hydrocarbons, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (manufacture of catalyst for catalytic oxidation of hydrocarbon)
 IT 149920-39-8, Cerium molybdenum niobium tellurium vanadium oxide
 204124-61-8, Molybdenum niobium silicon tellurium tungsten vanadium oxide
 204124-63-0 204125-27-9
 RL: CAT (Catalyst use); USES (Uses)
 (manufacture of catalyst for catalytic oxidation of hydrocarbon)
 IT 107-13-1P, Acrylonitrile, preparation
 RL: PNU (Preparation, unclassified); PREP (Preparation)
 (manufacture of catalyst for catalytic oxidation of hydrocarbon)
 IT 74-98-6, Propane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)

(manufacture of catalyst for catalytic oxidation of hydrocarbon)

L38 ANSWER 16 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1997:702010 HCAPLUS
 DN 127:331206
 ED Entered STN: 07 Nov 1997
 TI Preparation of isobutylene, methacrolein, and/or methacrylic acid
 IN Okusako, Akinori; Ui, Toshiaki; Nagai, Koichi
 PA Sumitomo Chemical Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF

DT Patent
 LA Japanese
 IC ICM C07C011-09
 ICS B01J023-28; C07C005-48; C07C027-12; C07C045-28; C07C047-22;
 C07C057-05; C07B061-00
 CC 23-16 (Aliphatic Compounds)
 FAN.CNT 1.

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 09278680	A2	19971028	JP 1996-88029	19960410 <--
PRAI JP 1996-88029			19960410 <--	

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 09278680	ICM C07C011-09 ICS B01J023-28; C07C005-48; C07C027-12; C07C045-28; C07C047-22; C07C057-05; C07B061-00	
JP 09278680	ECLA C07C005/48+11/09; C07C045/35+47/22	<--
AB	Alkene and/or O-containing compds. are prepared by catalytic oxidation of isobutane with mol. O in gas phase in the presence of Mo _x V _y B _z X _w Y _t Z _u O _f (X = Sb, Te; Y = ≥1 elements chosen from As, B, and Ge; Z = ≥1 elements chosen from K, Cs, Rb, Ca, Mg, Ti, Cr, Mn, Fe, Co, Ni, Cu, Ag, Bi, Al, Ga, In, Sn, Zn, La, Ce, Y, W, Nb, and Ta) catalysts. An ion-exchanged water solution of Nb(HCO ₄) ₅ .nH ₂ O and aqueous vanadyl oxalate containing 2 mol/l vanadium	

was mixed with (NH₄)₆Mo₇O₂₄.4H₂O and Sb₂O₃, neutralized using aqueous NH₃, concentrated to dryness by heating, calcined at 600° for 2 h to give Mo₁₂V₃Sb₉Nb_{1.5}O_x. A gaseous mixt containing isobutane, O, N, and steam with 25, 12, 33, and 30 %, resp, was fed into the catalyst at 425° and a space velocity 1000 h⁻¹ under 152 kPa to give isobutylene, methacrolein, and methacrylic acid with 11.9%, 23.8%, and 7.8% selectivity, resp., at 6.3% conversion.

ST isobutane oxidn molybdenum catalyst; vanadium catalyst oxidn isobutane; alkene oxygen contg compd prep; isobutylene methacrolein methacrylic acid prep

IT Oxidation catalysts
 (preparation of isobutylene, methacrolein, and methacrylic acid by oxidation of isobutane using catalysts)

IT 7440-38-2, Arsenic, uses 7440-42-8, Boron, uses 55521-81-8, Antimony molybdenum vanadium oxide 146569-48-4, Molybdenum niobium tellurium vanadium oxide 193405-60-6, Antimony molybdenum niobium vanadium oxide 198018-00-7 198018-02-9 198018-04-1

RL: CAT (Catalyst use); USES (Uses)
 (preparation of isobutylene, methacrolein, and methacrylic acid by oxidation of isobutane using catalysts)

IT 78-85-3P, Methacrolein 79-41-4P, Methacrylic acid, preparation

115-11-7P, Isobutylene, preparation
 RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP
 (Preparation)

(preparation of isobutylene, methacrolein, and methacrylic acid by
 oxidation of
 isobutane using catalysts)

IT 75-28-5, Isobutane 7782-44-7, Oxygen, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (preparation of isobutylene, methacrolein, and methacrylic acid by
 oxidation of
 isobutane using catalysts)

L38 ANSWER 17 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1996:34864 HCAPLUS

DN 124:147122

ED Entered STN: 18 Jan 1996

TI Molybdenum oxide ammoxidation catalyst for the production of nitriles
 IN Ushikubo, Takashi; Oshima, Kazunori; Kayo, Atsushi; Umezawa, Tiaki;
 Kiyono, Ken-ichi; Sawaki, Itaru; Nakamura, Hiroya

PA Mitsubishi Chemical Corporation, Japan

SO U.S., 19 pp. Cont.-in-part of U.S. Ser. No. 121,564, abandoned.
 CODEN: USXXAM

DT Patent

LA English

IC ICM B01J023-28

ICS B01J023-22

INCL 502312000

CC 35-2 (Chemistry of Synthetic High Polymers)

FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5472925	A	19951205	US 1994-193403	19940207 <--
	JP 05208136	A2	19930820	JP 1992-211425	19920807 <--
	JP 3331629	B2	20021007		
	US 5281745	A	19940125	US 1992-926173	19920807 <--
	JP 05279313	A2	19931026	JP 1992-216016	19920813 <--
	JP 3168716	B2	20010521		
	JP 06228074	A2	19940816	JP 1993-18923	19930205 <--
	JP 3306950	B2	20020724		
PRAI	JP 1991-199573	A	19910808	<--	
	JP 1992-18962	A	19920204	<--	
	US 1992-926173	A3	19920807	<--	
	JP 1993-18923	A	19930205	<--	
	US 1993-121564	B2	19930916	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES	
	US 5472925	ICM	B01J023-28	
		ICS	B01J023-22	
		INCL	502312000	
	US 5472925	NCL	502/312.000; 502/311.000; 502/319.000; 502/321.000; 502/324.000; 502/326.000; 502/329.000; 502/353.000; 502/354.000; 558/319.000	
		ECLA	B01J023/00B; B01J027/057T; C07C253/24	<--
	US 5281745	NCL	558/319.000	<--

AB The title catalysts for the production of a nitrile from an alkane, is represented by MoaVbTecXxOn, wherein X is \geq element selected from Nb, Ta, W, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pd, Pt, Sb, Bi, B and Ce, when a = 1, b = 0.01-1.0, c = 0.01-1.0, x = 0.01-1.0, and n is a number such that the total valency of the metal elements is satisfied. The

catalyst has a specified X-ray diffraction pattern. Propane was ammoxidized to acrylonitrile using a MoV0.3Te0.23Nb0.12On catalyst.

ST alkane ammoxidn nitrile; molybdenum catalyst ammoxidn

IT Ammoxidation catalysts
 (molybdenum oxide ammoxidn. catalyst for the production of nitriles)

IT Nitriles, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (molybdenum oxide ammoxidn. catalyst for the production of nitriles)

IT Alkanes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (molybdenum oxide ammoxidn. catalyst for the production of nitriles)

IT 146569-48-4, Molybdenum niobium tellurium vanadium oxide 146569-51-9, Aluminum molybdenum tellurium vanadium oxide 146569-54-2, Antimony molybdenum tellurium vanadium oxide 149920-42-3, Molybdenum niobium palladium tellurium vanadium oxide
 RL: CAT (Catalyst use); USES (Uses)
 (molybdenum oxide ammoxidn. catalyst for the production of nitriles)

IT 107-13-1P, Acrylonitrile, preparation 126-98-7P, Methacrylonitrile
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (molybdenum oxide ammoxidn. catalyst for the production of nitriles)

IT 74-98-6, Propane, reactions 75-28-5, Isobutane 1304-76-3, Bismuth oxide, reactions 1306-38-3, Cerium oxide, reactions 1308-38-9, Chromium oxide, reactions 1310-53-8, Germanium oxide, reactions 1314-36-9, Yttrium oxide, reactions 1317-36-8, Lead oxide, reactions 1332-81-6, Tetravalent antimony oxide 7664-41-7, Ammonia, reactions 7784-27-2, Aluminum nitrate nonahydrate 7791-08-4 7803-55-6, Ammonium metavanadate 10035-06-0 10043-35-3, Orthoboric acid, reactions 10102-05-3, Palladium nitrate 11120-48-2, Telluric acid 12027-67-7, Ammonium paramolybdate 168547-43-1
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (molybdenum oxide ammoxidn. catalyst for the production of nitriles)

L38 ANSWER 18 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1995:522594 HCAPLUS
 DN 122:266250
 ED Entered STN: 04 May 1995
 TI Unsaturated carboxylic acid by oxidation of alkane using certain mixed metal oxides.
 IN Ushikubo, Takashi; Nakamura, Hiroya; Koyasu, Yukio; Wajiki, Shin
 PA Mitsubishi Kasei Corp., Japan
 SO Eur. Pat. Appl., 9 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM C07C057-04
 ICS C07C057-05; B01J023-28; C07C051-215
 CC 35-2 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 67

FAN.CNT 1	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 608838	A2	19940803	EP 1994-101067	19940125 <--
	EP 608838	A3	19941214		
	EP 608838	B1	19970416		
	R: DE, FR, GB				
	JP 07010801	A2	19950113	JP 1993-153651	19930624 <--
	JP 3237314	B2	20011210		
	JP 06279351	A2	19941004	JP 1993-308013	19931208 <--
	JP 3334296	B2	20021015		
	US 5380933	A	19950110	US 1994-187719	19940128 <--

PRAI JP 1993-12616 A 19930128 <--
 JP 1993-153651 A 19930624 <--
 JP 1993-308013 A 19931208 <--

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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EP 608838	ICM	C07C057-04
	ICS	C07C057-05; B01J023-28; C07C051-215
EP 608838	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J027/057T; C07C051/215; C07C051/215+57/04
US 5380933	NCL	562/549.000; 562/547.000
	ECLA	B01J023/00B; B01J023/20; B01J023/28; B01J027/057T; C07C051/215; C07C051/215+57/04

AB A method for producing an unsatd. carboxylic acid, especially (meth)acrylic acid, comprises subjecting an alkane to a vapor phase catalytic oxidation in the presence of a catalyst containing a mixed metal oxide of Mo, V, Te, O and X (X = ≥1 of Nb, Ta, W, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pd, Pt, Sb, Bi, B, In and Ce), satisfying the following formulas: 0.25 < rMo < 0.98; 0.003 < rV < 0.5; 0.003 < rTe < 0.5; 0.003 < rX < 0.5; wherein r = molar fractions of Mo, V, Te and X, resp. C3H6:air 1:15 at 400° and SV 1734 h-1 in the presence of Mo1V0.3Te0.23Nb0.12On (preparation given) gave conversion of C3H6 75.3% and selectivity for acrylic acid 42.4%.

ST propane oxidn catalyst acrylic acid manuf; molybdenum oxide catalyst oxidn; vanadium oxide catalyst oxidn; tellurium oxide catalyst oxidn; niobium oxide catalyst oxidn

IT Oxidation catalysts

(mixed metal oxides for conversion of alkane to unsatd. carboxylic acid)

IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses 7440-42-8, Boron, uses 7440-45-1, Cerium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 7440-69-9, Bismuth, uses 7440-74-6, Indium, uses 13494-80-9, Tellurium, uses

RL: CAT (Catalyst use); USES (Uses)
(catalyst component in mixed metal oxide for conversion of alkane to unsatd. carboxylic acid)

IT 149920-40-1, Bismuth molybdenum niobium tellurium vanadium oxide

RL: CAT (Catalyst use); USES (Uses)
(catalyst for conversion to acrylic acid)

IT 79-10-7P, Acrylic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)
(catalyst for conversion to acrylic acid)

IT 74-98-6, Propane, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)
(catalyst for conversion to acrylic acid)

IT 146569-48-4, Molybdenum niobium tellurium vanadium oxide

RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(oxidation catalyst for conversion of propane to acrylic acid)

L38 ANSWER 19 OF 20 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1993:539968 HCAPLUS

DN 119:139968

ED Entered STN: 02 Oct 1993

TI Process for producing nitriles

IN Ushikubo, Takashi; Oshima, Kazunori; Kayo, Atsushi; Umezawa, Tiaki; Kiyono, Kenichi; Sawaki, Itaru

PA Mitsubishi Kasei Corp., Japan
 SO Eur. Pat. Appl., 39 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM C07C253-24
 ICS B01J027-057
 CC 35-2 (Chemistry of Synthetic High Polymers)
 FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 529853	A2	19930303	EP 1992-307260	19920807 <--
	EP 529853	A3	19930519		
	EP 529853	B1	19960228		
	R: DE, FR, GB, IT, NL				
	BR 9203080	A	19930330	BR 1992-3080	19920807 <--
	JP 05208136	A2	19930820	JP 1992-211425	19920807 <--
	JP 3331629	B2	20021007		
	CN 1069723	A	19930310	CN 1992-109282	19920808 <--
	CN 1031640	B	19960424		
	JP 05279313	A2	19931026	JP 1992-216016	19920813 <--
	JP 3168716	B2	20010521		
PRAI	JP 1991-199573	A	19910808	<--	
	JP 1992-18962	A	19920204	<--	

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	EP 529853	ICM	C07C253-24
		ICS	B01J027-057
	EP 529853	ECLA	B01J023/00B; B01J027/057T; C07C253/24 <--
AB	A nitrile (especially H ₂ C:CHCN) is prepared by oxidation of an alkane and gaseous NH ₃ containing a complex metal oxide catalyst; the catalyst has x-ray diffraction peaks at 20 22.1 ± 1.0, 28.2 ± 1.0, 36.2 ± 0.3, 45.2 ± 0.3, 50.0° ± 0.3. In an example, H ₂ C:CHCN was prepared in a gas-phase reaction of propane/NH ₃ /air at 1:1.2:15 molar ratio at 420° and space velocity 1000 h ⁻¹ in presence of MoV0.4Te0.2Nb0.1O4.25 (calcined at 620°); conversion of propane 79.4%; selectivity for H ₂ C:CHCN 63.5%; and yield of H ₂ C:CHCN 50.4%.		
ST	acrylonitrile prepn propane ammonia; ammoxidn catalyst mixed metal oxide; tellurium mixed metal oxide ammoxidn catalyst		
IT	Alkanes, reactions RL: RCT (Reactant); RACT (Reactant or reagent) (ammoxidn. of, to unsatd. nitriles, mixed metal oxide catalysts for)		
IT	Ammoxidation catalysts (molybdenum tellurium vanadium oxides, for nitrile preparation from alkanes and ammonia)		
IT	Ammoxidation (of alkanes, to unsatd. nitriles, process for)		
IT	Nitriles, preparation RL: PREP (Preparation) (unsatd., preparation of, by ammoxidn. of alkanes, mixed metal oxide catalysts for)		
IT	74-98-6, Propane, reactions RL: RCT (Reactant); RACT (Reactant or reagent) (ammoxidn. of, to acrylonitrile, mixed metal oxide catalysts for)		
IT	75-28-5, Isobutane RL: PROC (Process) (ammoxidn. of, to methacrylonitrile, mixed metal oxide catalysts for)		
IT	146569-48-4	146569-51-9	146569-54-2 149920-38-7

149920-39-8 149920-40-1 149920-41-2

149920-42-3

RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for ammoxidn. of alkanes with air and ammonia)

IT 126-98-7P, Methacrylonitrile

RL: IMF (Industrial manufacture); PREP (Preparation)
 (manufacture of, by ammoxidn. of isobutane, mixed metal oxide catalysts for)

IT 107-13-1P, 2-Propenenitrile, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(manufacture of, by ammoxidn. of propane, mixed metal oxide catalysts for)

IT 7664-41-7, Ammonia, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(oxidation of alkanes with air and, to unsatd. nitriles)

L38 ANSWER 20 OF 20 HCPLUS COPYRIGHT 2005 ACS on STN

AN 1993:149827 HCPLUS

DN 118:149827

ED Entered STN: 13 Apr 1993

TI Process for producing nitriles

IN Ushikubo, Takashi; Oshima, Kazunori; Umezawa, Tiaki; Kiyono, Kenichi

PA Mitsubishi Kasei Corp., Japan

SO Eur. Pat. Appl., 12 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM C07C253-24

ICS C07C255-08

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

Section cross-reference(s): 23, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 512846	A1	19921111	EP 1992-304144	19920508 <--
	EP 512846	B1	19950412		
	R: DE, FR, GB, IT, NL				
	JP 05148212	A2	19930615	JP 1992-114884	19920507 <--
	JP 3235177	B2	20011204		
	US 5231214	A	19930727	US 1992-880687	19920508 <--
	CN 1066445	A	19921125	CN 1992-103439	19920509 <--
	CN 1028752	B	19950607		
PRAI	JP 1991-104382	A	19910509	<--	

CLASS

PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES

EP 512846 ICM C07C253-24

ICS C07C255-08

EP 512846 ECLA C07C253/24

US 5231214 NCL 558/319.000; 558/318.000

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OS CASREACT 118:149827

AB A process for producing a nitrile, comprises subjecting an alkane and ammonia in the gaseous state to catalytic oxidation in the presence of MoVbTecNbDxOn wherein: X is at least one of Mg, Ca, Sr, Ba, Al, Ga, Tl, In, Ti, Zr, Hf, Ta, Cr, Mn, W, Fe, Ru, Co, Rh, Ni, Pd, Pt, Zn, Sn, Pb, As, Sb, Bi, La and Ce; b is from 0.01 to 1.0; c is from 0.01 to 1.0; d is from 0 to 1.0; x is from 0.0005 to 1.0; and n is a number such that the total valency of the metal elements is satisfied. Thus, a feed gas of 1:1.2:10 propane/NH₃/air at a space velocity of 1000 h⁻¹ at 440° over MoV0.4Te0.2Nb0.1Mn0.1On gave 23.9% acrylonitrile with 57.5% conversion of propane.

ST nitrile; acrylonitrile; ammoxidn alkane catalyst metal oxide; molybdenum

vanadium catalyst ammoxidn propane
 IT Ammoxidation catalysts
 (molybdenum tungsten metal oxides, for propane)
 IT Ammoxidation
 (of propane)
 IT 74-98-6, Propane, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (ammoxidn. of, molybdenum vanadium oxide catalysts for)
 IT 146569-47-3 146569-48-4 146569-49-5 146569-50-8 146569-51-9
 146569-52-0 146569-53-1 146569-54-2 146569-55-3 146569-56-4
 146569-57-5 146569-58-6 146569-59-7 146569-60-0 146569-61-1
 146569-62-2 146569-65-5 146569-66-6 146569-67-7
 146569-68-8 146569-69-9 146569-70-2
 RL: CAT (Catalyst use); USES (Uses)
 (catalyst, for ammoxidn. of propane)
 IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-95-4, Magnesium,
 uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses
 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-05-3, Palladium,
 uses 7440-25-7, Tantalum, uses 7440-31-5, Tin, uses 7440-32-6,
 Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses
 7440-39-3, Barium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt,
 uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-69-9,
 Bismuth, uses 7440-70-2, Calcium, uses 13494-80-9, Tellurium, uses
 RL: USES (Uses)
 (catalysts containing mixed metal oxides and, for ammoxidn. of propane)
 IT 146569-63-3 146569-64-4
 RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for ammoxidn. of propane)
 IT 10102-05-3, Palladium nitrate
 RL: USES (Uses)
 (molybdenum vanadium oxide catalyst from, for ammoxidn. of propane)
 IT 107-13-1P, Acrylonitrile, preparation
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (preparation of, by ammoxidn. of propane, molybdenum vanadium oxide catalyst
 for)

=> => d his 139-

(FILE 'HCAPLUS' ENTERED AT 14:14:53 ON 19 JUL 2005)

FILE 'USPATFULL' ENTERED AT 14:20:33 ON 19 JUL 2005

L39 44 S L26
 L40 0 S L39 AND B01J037/IPC
 L41 32 S L39 AND B01J/IPC
 L42 41 S L39 AND (PD<=20021001 OR PRD<=20021001 OR AD<=20021001)
 L43 19 S L39 AND (GAFFNEY ? OR SONG ?)/AU
 L44 3 S L39 AND (ROHM? OR ROEHM?)/PA
 L45 29 S L41 AND L42
 L46 31 S L43,L44,L45
 L47 13 S L39,L42 NOT L46

FILE 'REGISTRY' ENTERED AT 14:23:31 ON 19 JUL 2005

FILE 'HCAPLUS' ENTERED AT 14:25:39 ON 19 JUL 2005

FILE 'USPATFULL' ENTERED AT 14:26:43 ON 19 JUL 2005

L48 29 S L26/P
 L49 27 S L48 AND L42
 L50 29 S L48,L49

L51 37 S L50, L46
 L52 7 S L39 NOT L51

=> d l51 bib abs hitrn tot

L51 ANSWER 1 OF 37 USPATFULL on STN
 AN 2005:152340 USPATFULL
 TI Catalyst systems for converting alkanes to alkenes and to their corresponding oxygenated products
 IN Benderly, Abraham, Elkins Park, PA, UNITED STATES
 Chadda, Nitin, Radnor, PA, UNITED STATES
 Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Han, Scott, Lawrenceville, NJ, UNITED STATES
 Le, Dominique Hung Nhu, Upper Darby, PA, UNITED STATES
 Silvano, Mark Anthony, New Hope, PA, UNITED STATES
 PI US 2005131255 A1 20050616
 AI US 2004-987367 A1 20041112 (10)
 PRAI US 2003-523297P 20031118 (60)
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399, US
 CLMN Number of Claims: 27
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 2084

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Alkenes, unsaturated saturated carboxylic acids, saturated carboxylic acids and their higher analogues are prepared directly from corresponding alkanes utilizing using a mixed bed catalyst at flame temperatures in a short contact time reactor.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 149920-42-3P
 (catalyst; preparation of catalyst systems for converting alkanes to alkenes and to their corresponding oxygenated products)

L51 ANSWER 2 OF 37 USPATFULL on STN
 AN 2005:124862 USPATFULL
 TI Process for preparing mixed metal oxide catalyst
 IN Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Martinez, Jose L., Gibsonia, PA, UNITED STATES
 Song, Ruozhi, Wilmington, DE, UNITED STATES
 PI US 2005107252 A1 20050519
 AI US 2004-978853 A1 20041101 (10)
 PRAI US 2003-520758P 20031117 (60)
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399, US
 CLMN Number of Claims: 13
 ECL Exemplary Claim: 1
 DRWN 3 Drawing Page(s)
 LN.CNT 1005

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention includes a process for preparing an improved catalyst having the steps of admixing compounds containing the components of the catalyst and at least one solvent to form a precursor; extracting the precursor with a supercritical stream to form a processed precursor, where the extracting step includes drying the precursor,

atomizing the precursor, and combinations thereof; and calcining the processed precursor to form a catalyst. The process may include drying the precursor by introducing the precursor, which has been previously washed with an alcohol, such as ethanol or methanol, into a vessel and introducing the supercritical stream at a pressure and temperature above the critical point of the stream into the vessel. The process may include drying and atomizing the precursor by introducing the supercritical solvent into the vessel at a pressure and a temperature above critical point of the solvent and introducing the precursor into the extraction vessel through a nozzle. The process may also include drying and atomizing the precursor by introducing the precursor and the supercritical solvent into the vessel through a nozzle.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 149920-42-3

(mixed metal oxide catalyst for vapor phase oxidation and ammonoxidn. of alkanes and alkenes to unsatd. carboxylic acids or nitriles)

L51 ANSWER 3 OF 37 USPATFULL on STN
 AN 2004:292978 USPATFULL
 TI Catalyst for selective oxidation and ammonoxidation of alkanes and/or alkenes, particularly in processes for obtaining acrylic acid, acrylonitrile and the derivatives thereof
 IN Lopez Nieto, Jose Manuel, Valencia, SPAIN
 Asuncion, Pablo Botella, Valencia, SPAIN
 Solsona Espriu, Benjamin, Valencia, SPAIN
 PI US 2004230070 A1 20041118
 AI US 2004-759384 A1 20040116 (10)
 RLI Continuation of Ser. No. WO 2002-ES357, filed on 16 Jul 2002, UNKNOWN
 PRAI ES 2001-1756 20010717 <--
 DT Utility
 FS APPLICATION
 LREP KLAUBER & JACKSON, 4th Fl., 411 Hackensack Avenue, Hackensack, NJ, 07601
 CLMN Number of Claims: 14
 ECL Exemplary Claim: 1
 DRWN 8 Drawing Page(s)
 LN.CNT 827

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst for the selective oxidation and ammonoxidation of alkanes and/or alkenes, particularly in processes for obtaining acrylic acid, acrylonitrile and derivatives of these, including a least one oxide of Mo, Te, V, Cu and at least another A component selected from among Nb, Ta, Sn, Se, W, Ti, Fe, Co, Ni, Cr, Ga, Sb, Bi, a rare, alkaline or alkali-earth earth, in such a way that the catalyst presents, in a calcined form, an X-ray diffractogram with five intensive diffraction lines, typically the most intense corresponding to diffraction angles of 20 at 22.1 ± 0.4 , 27.1 ± 0.4 ; 28.1 ± 0.4 , 36.0 ± 0.4 and 45.1 ± 0.4 .

In the preferred embodiment, the catalyst has the following empiric formula:

$\text{MoTe}_{\text{sub}} \cdot \text{hV}_{\text{sub}} \cdot \text{iCu}_{\text{sub}} \cdot \text{jA}_{\text{sub}} \cdot \text{kO}_{\text{sub}} \cdot \text{x}$

in which h, i, j, k are values comprised between 0.001 and 4.0 and x depends on the oxidation status or valency of the Mo, Te, V, Cu and A elements.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 406681-66-1P, Copper molybdenum niobium tellurium vanadium oxide

(mixed metal oxide catalyst for the selective oxidation and ammoxidn. of alkanes and/or alkenes to (meth)acrylic acid or acrylonitrile)

L51 ANSWER 4 OF 37 USPATFULL on STN
 AN 2004:248363 USPATFULL
 TI Catalyst composition for the selective conversion of alkanes to unsaturated carboxylic acids, method of making and method of using thereof
 IN Hazin, Paulette N., Houston, TX, UNITED STATES
 Ellis, Paul E., JR., Sugar Land, TX, UNITED STATES
 PA Saudi Basic Industries Corporation (U.S. corporation)
 PI US 2004192966 A1 20040930
 AI US 2004-806862 A1 20040323 (10)
 PRAI US 2003-457117P 20030324 (60)
 DT Utility
 FS APPLICATION
 LREP SABIC AMERICAS, INC., 1600 INDUSTRIAL BLVD., SUGAR LAND, TX, 77478
 CLMN Number of Claims: 89
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 975
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.
 AB A catalyst composition having the formula:

Mo._asub._bV_csub._dSb_esub._fNb_gsub._hM_isub._jO_ksub._lx

wherein M is gallium, bismuth, silver or gold, a is 0.01 to 1, b is 0.01 to 1, c is 0.01 to 1, d is 0.01 to 1 and x is determined by the valence requirements of the other components. Other metals, such as tantalum, titanium, aluminum, zirconium, chromium, manganese, iron, ruthenium, cobalt, rhodium, nickel, platinum, boron, arsenic, lithium, sodium, potassium, rubidium, calcium, beryllium, magnesium, cerium, strontium, hafnium, phosphorus, europium, gadolinium, dysprosium, holmium, erbium, thulium, terbium, ytterbium, lutetium, lanthanum, scandium, palladium, praseodymium, neodymium, yttrium, thorium, tungsten, cesium, zinc, tin, germanium, silicon, lead, barium or thallium may also be components of the catalyst. This catalyst is prepared by co-precipitation of metal compounds which are calcined to form a mixed metal oxide catalyst that can be used for the selective conversion of an alkane to an unsaturated carboxylic acid in a one-step process.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.
 IT 260557-95-7P, Antimony bismuth molybdenum niobium vanadium oxide
 261919-86-2P, Antimony gallium molybdenum niobium vanadium oxide
 511313-29-4P, Antimony gold molybdenum niobium vanadium oxide
 766557-27-1P
 (mixed oxide catalysts for selective conversion of alkanes to unsatd. carboxylic acids)

L51 ANSWER 5 OF 37 USPATFULL on STN
 AN 2004:152517 USPATFULL
 TI Process for preparing a catalyst and catalytic oxidation therewith
 IN Lin, Manhua, Maple Glen, PA, UNITED STATES
 PI US 2004116739 A1 20040617
 AI US 2003-731512 A1 20031209 (10)
 RLI Division of Ser. No. US 2001-754942, filed on 4 Jan 2001, GRANTED, Pat. No. US 6693059
 PRAI US 2000-181412P 20000209 (60) <--
 DT Utility
 FS APPLICATION

LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
PHILADELPHIA, PA, 19106-2399

CLMN Number of Claims: 10

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 570

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process useful for the catalytic gas phase oxidation of alkanes to unsaturated aldehydes or carboxylic acids uses catalysts of particular compositions formed in a particular manner.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 204125-27-9P, Molybdenum niobium tellurium tungsten vanadium oxide
(catalyst; preparation of alkane oxidation catalyst)

L51 ANSWER 6 OF 37 USPATFULL on STN

AN 2004:152515 USPATFULL

TI Nox treated mixed metal oxide catalyst

IN Gaffney, Anne Mae, West Chester, PA, UNITED STATES

Heffner, Michele Doreen, Chalfont, PA, UNITED STATES

Song, Ruozhi, Wilmington, DE, UNITED STATES

PI US 2004116737 A1 20040617

AI US 2003-731523 A1 20031209 (10)

RLI Continuation-in-part of Ser. No. US 2002-116241, filed on 4 Apr 2002,
PENDING

PRAI US 2001-283260P 20010412 (60)

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DT Utility

FS APPLICATION

LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
PHILADELPHIA, PA, 19106-2399

CLMN Number of Claims: 12

ECL Exemplary Claim: 1

DRWN 1 Drawing Page(s)

LN.CNT 1422

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB An improved catalyst comprising a mixed metal oxide, either promoted or not, is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 149920-42-3P, Molybdenum niobium palladium tellurium vanadium
oxide

(preparation of NO_x treated mixed metal oxide catalysts useful for vapor
oxidation of alkane to unsatd. carboxylic acids)

L51 ANSWER 7 OF 37 USPATFULL on STN

AN 2004:83534 USPATFULL

TI Hydrothermally synthesized MO-V-M-NB-X oxide catalysts for the selective
oxidation of hydrocarbons

IN Gaffney, Anne Mae, West Chester, PA, UNITED STATES

Song, Ruozhi, Wilmington, DE, UNITED STATES

PI US 2004063990 A1 20040401

AI US 2003-676884 A1 20030930 (10)

PRAI US 2002-415288P 20021001 (60)

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DT Utility

FS APPLICATION

LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
PHILADELPHIA, PA, 19106-2399

CLMN Number of Claims: 11

ECL Exemplary Claim: 1

DRWN 4 Drawing Page(s)

LN.CNT 1700

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Hydrothermally synthesized catalysts comprising a mixed metal oxide are utilized to produce unsaturated carboxylic acids by the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, in the presence thereof; or to produce unsaturated nitrites by the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, and ammonia in the presence thereof.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 146569-65-5P, Cobalt molybdenum niobium tellurium vanadium oxide
 146569-67-7P, Iron molybdenum niobium tellurium vanadium oxide
 146569-68-8P, Magnesium molybdenum niobium tellurium vanadium oxide 146569-69-9P, Molybdenum nickel niobium tellurium vanadium oxide 146569-70-2P, Manganese molybdenum niobium tellurium vanadium oxide 149920-42-3P, Molybdenum niobium palladium tellurium vanadium oxide 224324-44-1P, Molybdenum niobium samarium tellurium vanadium oxide 224324-48-5P, Lanthanum molybdenum niobium tellurium vanadium oxide 406675-48-7P, Molybdenum niobium tellurium vanadium zinc oxide 406675-79-4P, Molybdenum niobium tellurium vanadium bromide oxide 406675-80-7P, Molybdenum niobium tellurium vanadium chloride oxide 406675-82-9P, Molybdenum niobium tellurium vanadium iodide oxide 406675-87-4P, Indium molybdenum niobium tellurium vanadium oxide 675571-72-9P, Lead molybdenum niobium tellurium vanadium oxide 676365-84-7P 676365-85-8P
 676365-86-9P 676365-87-0P 676365-88-1P
 676365-89-2P

(hydrothermally synthesized Mo-V-M-Nb-X-O oxide catalysts for the selective oxidation of hydrocarbons)

L51 ANSWER 8 OF 37 USPATFULL on STN

AN 2004:82420 USPATFULL

TI Heterogeneously catalyzed gas-phase partial oxidation of acrolein to acrylic acid

IN Dieterle, Martin, Mannheim, GERMANY, FEDERAL REPUBLIC OF
 Borgmeier, Frieder, Mannheim, GERMANY, FEDERAL REPUBLIC OF
 Mueller-Engel, Klaus Joachim, Stutensee, GERMANY, FEDERAL REPUBLIC OF
 Hibst, Hartmut, Schriesheim, GERMANY, FEDERAL REPUBLIC OFPA BASF Aktiengesellschaft, Ludwigshafen, GERMANY, FEDERAL REPUBLIC OF
 (non-U.S. corporation)

PI US 2004062870 A1 20040401

AI US 2003-667786 A1 20030923 (10)

PRAI DE 2002-10261186 20021220
 DE 2002-10245585 20020927 <--
 DE 2002-10246119 20021001 <--
 DE 2002-10248584 20021017
 DE 2002-10254278 20021120
 DE 2002-10254279 20021120

DT Utility

FS APPLICATION

LREP OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C., 1940 DUKE STREET,
 ALEXANDRIA, VA, 22314

CLMN Number of Claims: 27

ECL Exemplary Claim: 1

DRWN 17 Drawing Page(s)

LN.CNT 1221

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process for the heterogeneously catalyzed gas-phase partial oxidation of acrolein to acrylic acid over a multimetal oxide material having a specific structure, which contains the elements Mo and V, at least one of the elements Te and Sb and at least one of the elements from the group consisting of Nb, Ta, W and Ti and is doped with promoter elements, is described.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 146569-65-5P 146569-69-9P 149920-40-1P
149920-42-3P 675571-72-9P
(heterogeneously catalyzed gas-phase partial oxidation of acrolein to acrylic acid)

L51 ANSWER 9 OF 37 USPATFULL on STN

AN 2004:70993 USPATFULL

TI Alkane oxidation catalyst, process for producing the same, and process for producing oxygen-containing unsaturated compound

IN Kobayashi, Tomoaki, Yamaguchi, JAPAN
Seo, Yoshimasa, Gunma, JAPAN

PI US 2004054221 A1 20040318

AI US 2003-450373 A1 20030610 (10)
WO 2001-JP11180 20011220 <--

PRAI JP 2000-391078 20001222 <--
JP 2001-94513 20010329 <--
JP 2001-108122 20010406 <--

DT Utility

FS APPLICATION

LREP Kevin S Lemack, Nields & Lemack, Suite 8, 176 East Main Street,
Westboro, MA, 01581

CLMN Number of Claims: 11

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 671

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB An object of the present invention is to provide a highly active catalyst for producing an unsaturated oxygen-containing compound from an alkane and the catalyst comprising Mo, V, Ti and Sb or Te as the indispensable active components. The preferable catalyst is represented by formula (1) or (2) as shown below,

Mo._aV._bTi._cX._dY._eO._f (1)

Mo._aV._bTi._cX._dY._eZ._fO._g (2)

wherein X represents Sb or Te; Y represents Nb, W or Zr; Z represents Li, Na, K, Rb, Cs, Mg, Ca or Sr; a, b, c, d, e and f represent atomic ratios of their respective elements, with $0 < a < 0.7$, $0 < b < 0.3$, $0 < c < 0.7$, $0 \leq d < 0.3$, $0 < f < 0.1$; e is a number determined by oxidation states of the other elements than oxygen.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 380413-67-2P 380413-74-1P
(high-activity oxidation catalysts for propane for preparation of acrylic acid)

L51 ANSWER 10 OF 37 USPATFULL on STN

AN 2004:39184 USPATFULL

TI Annealed and promoted catalyst

IN Gaffney, Anne Mae, West Chester, PA, UNITED STATES

Heffner, Michele Doreen, Chalfont, PA, UNITED STATES
 Song, Ruozhi, Wilmington, DE, UNITED STATES

PI US 2004029725 A1 20040212
 AI US 2003-636113 A1 20030807 (10)
 RLI Division of Ser. No. US 2002-117904, filed on 8 Apr 2002, GRANTED, Pat.
 No. US 6645905
 PRAI US 2001-286278P 20010425 (60) <--
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399
 CLMN Number of Claims: 12
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 1401

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A mixed metal oxide, which may be an orthorhombic phase material, is improved as a catalyst for the production of unsaturated carboxylic acids, or unsaturated nitriles, from alkanes, or mixtures of alkanes and alkenes, by: contacting with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture; recovering insoluble material from the contact mixture; calcining the recovered insoluble material in a non-oxidizing atmosphere; admixing the calcined recovered insoluble material with (i) at least one promoter element or compound thereof and (ii) at least one solvent for the at least one promoter element or compound thereof; removing the at least one solvent to form a catalyst precursor; and calcining the catalyst precursor.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 224324-44-1P, Molybdenum niobium samarium tellurium vanadium oxide (annealed and promoted catalyst for production of unsatd. carboxylic acids and nitriles)

L51 ANSWER 11 OF 37 USPATFULL on STN
 AN 2003:289349 USPATFULL
 TI Ir and/or Sm promoted multi-metal oxide catalyst
 IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES
 Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Han, Scott, Lawrenceville, NJ, UNITED STATES
 Heffner, Michele Doreen, Chalfont, PA, UNITED STATES
 Song, Ruozhi, Wilmington, DE, UNITED STATES
 PI US 2003204111 A1 20031030
 US 6790988 B2 20040914
 AI US 2003-430599 A1 20030507 (10)
 RLI Division of Ser. No. US 2001-927288, filed on 10 Aug 2001, PENDING
 PRAI US 2000-235980P 20000928 (60) <--
 US 2000-235981P 20000928 (60) <--
 US 2000-236143P 20000929 (60) <--
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399
 CLMN Number of Claims: 10
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 1170

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an

alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 224324-44-1P, Molybdenum niobium samarium tellurium vanadium oxide
406675-66-9P
(iridium and/or samarium promoted multi-metal oxide oxidation and
ammoxidn. catalysts)

L51 ANSWER 12 OF 37 USPATFULL on STN
 AN 2003:271728 USPATFULL
 TI Zn and/or Ga promoted multi-metal oxide catalyst
 IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES
 Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Han, Scott, Lawrenceville, NJ, UNITED STATES
 Nhu Le, Dominique Hung, Upper Darby, PA, UNITED STATES
 PI US 2003191336 A1 20031009
 US 6700015 B2 20040302
 AI US 2003-430194 A1 20030506 (10)
 RLI Division of Ser. No. US 2001-928019, filed on 10 Aug 2001, GRANTED, Pat.
 No. US 6589907
 PRAI US 2000-235978P 20000928 (60) <--
 US 2000-236129P 20000928 (60) <--
 US 2000-236260P 20000928 (60) <--
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399
 CLMN Number of Claims: 10
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 1378

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 406675-48-7P 406675-50-1P
(zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidn.
catalyst)

L51 ANSWER 13 OF 37 USPATFULL on STN
 AN 2003:251945 USPATFULL
 TI Halogen promoted multi-metal oxide catalyst
 IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES
 Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Han, Scott, Lawrenceville, NJ, UNITED STATES
 Heffner, Michele Doreen, Chalfont, PA, UNITED STATES
 Song, Ruozhi, Wilmington, DE, UNITED STATES
 PI US 2003176734 A1 20030918
 US 6747168 B2 20040608
 AI US 2003-444599 A1 20030522 (10)
 RLI Division of Ser. No. US 2002-225709, filed on 22 Aug 2002, PENDING
 Division of Ser. No. US 2001-927941, filed on 10 Aug 2001, GRANTED, Pat.
 No. US 6461996
 PRAI US 2000-235977P 20000928 (60) <--

US 2000-236261P	20000928 (60)	<--
US 2000-236262P	20000928 (60)	<--
US 2000-236263P	20000928 (60)	<--

DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399
 CLMN Number of Claims: 14
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 1270

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 406675-79-4P 406675-80-7P 406675-81-8P
 406675-82-9P
 (halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

L51 ANSWER 14 OF 37 USPATFULL on STN
 AN 2003:181746 USPATFULL
 TI Process for producing acrylic acid
 IN Yunoki, Hiromi, Himeji-shi, JAPAN
 PI US 2003125580 A1 20030703
 AI US 2002-228089 A1 20020827 (10) <--
 PRAI JP 2001-285033 20010919 <--
 DT Utility
 FS APPLICATION
 LREP ROYLANC, ABRAMS, BERDO & GOODMAN, L.L.P., 1300 19TH STREET, N.W., SUITE 600, WASHINGTON,, DC, 20036
 CLMN Number of Claims: 4
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 626

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides a process for producing acrylic acid, by which process the problem, such that the catalyst placed on the gas inlet side deteriorates faster than that placed on the gas outlet side, is solved, so that the catalyst can be used stably for a long time. The process for producing acrylic acid, according to the present invention, comprises the step of carrying out catalytic gas phase oxidation with a fixed-bed shell-and-tube reactor as packed with a catalyst, wherein: used as the catalyst is an oxide shown by the following general formula (1): $M_0 \cdot sub \cdot A^V \cdot sub \cdot B^A \cdot sub \cdot C^B \cdot sub \cdot D^C \cdot sub \cdot E^D \cdot sub \cdot F^E$ (1) (wherein: A shows at least one member selected from the group consisting of niobium and tungsten; B shows at least one member selected from the group consisting of chromium, manganese, iron, cobalt, nickel, copper, zinc, and bismuth; C shows at least one member selected from the group consisting of phosphorus, tin, antimony, and tellurium); and at least two reaction zones as provided by dividing the inside of each reaction tube in a direction of an axis of the tube in the reactor are packed with the catalyst such that there are regulated the kind and/or amount of the A component and/or the kind and/or amount of the B component.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 292139-85-6P, Antimony copper molybdenum niobium vanadium oxide

(process for producing acrylic acid)

L51 ANSWER 15 OF 37 USPATFULL on STN
 AN 2003:127903 USPATFULL
 TI Catalyst for use in catalytic oxidation or ammoxidation of propane or isobutane in the gaseous phase
 IN Komada, Satoru, Yokosuka-shi, JAPAN
 Hinago, Hidenori, Kurashiki-shi, JAPAN
 Nagano, Osamu, Yokohama-shi, JAPAN
 Watanabe, Mamoru, Okayama-ken, JAPAN
 PI US 2003088118 A1 20030508
 AI US 2002-231113 A1 20020830 (10) <--
 RLI Continuation-in-part of Ser. No. WO 2001-JP5055, filed on 14 Jun 2001,
 UNKNOWN
 PRAI JP 2000-179687 20000615 <--
 DT Utility
 FS APPLICATION
 LREP BIRCH STEWART KOLASCH & BIRCH, PO BOX 747, FALLS CHURCH, VA, 22040-0747
 CLMN Number of Claims: 12
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 2339

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Disclosed is an oxide catalyst comprising an oxide represented by the formula Mo._aV._bNb._cX._dY._eZ._fQ._gO._n (wherein: X is at least one element selected from the group consisting of Te and Sb; Y is at least one element selected from the group consisting of Al and W; Z is at least one element selected from the group consisting of elements which individually form an oxide having a rutile structure and a Z oxide having a rutile structure is used as a source of Z for producing the catalyst; Q is at least one element selected from the group consisting of titanium, tin, germanium, lead, tantalum, ruthenium, rhenium, rhodium, iridium, platinum, chromium, manganese, technetium, osmium, iron, arsenic, cerium, cobalt, magnesium, nickel and zinc, and a Q compound not having a rutile structure is used as a source of Q for producing the catalyst; and a, b, c, d, e, f and n are, respectively, the atomic ratios of V, Nb, X, Y, Z, Q and O, relative to Mo). Also disclosed is a process for producing an unsaturated carboxylic acid or an unsaturated nitrile by using the above-mentioned oxide catalyst.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 198018-04-1P 380413-67-2P 380413-74-1P
 (catalysts for vapor-phase catalytic oxidation and vapor-phase catalytic ammoxidn. of propane and isobutane)

L51 ANSWER 16 OF 37 USPATFULL on STN
 AN 2003:24364 USPATFULL
 TI Halogen promoted multi-metal oxide catalyst
 IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES
 Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Han, Scott, Lawrenceville, NJ, UNITED STATES
 Hefener, Michele Doreen, Chalfont, PA, UNITED STATES
 Song, Ruozhi, Wilmington, DE, UNITED STATES
 PI US 2003018208 A1 20030123
 US 6624111 B2 20030923
 AI US 2002-225709 A1 20020822 (10) <--
 RLI Division of Ser. No. US 2001-927941, filed on 10 Aug 2001, GRANTED, Pat.
 No. US 6461996
 PRAI US 2000-235977P 20000928 (60) <--

US 2000-236261P	20000928 (60)	<--
US 2000-236262P	20000928 (60)	<--
US 2000-236263P	20000928 (60)	<--

DT Utility
 FS APPLICATION
 LREP Alan Holler, Rohm and Haas Company - Patent Department, 100 Independence Mall West, Philadelphia, PA, 19106-2399
 CLMN Number of Claims: 14
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 1272

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 406675-79-4P 406675-80-7P 406675-81-8P
 406675-82-9P
 (halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

L51 ANSWER 17 OF 37 USPATFULL on STN
 AN 2003:6995 USPATFULL
 TI Promoted multi-metal oxide catalyst
 IN Chaturvedi, Sanjay, Horsham, PA, United States
 Gaffney, Anne Mae, West Chester, PA, United States
 Han, Scott, Lawrenceville, NJ, United States
 Heffner, Michele Doreen, Chalfont, PA, United States
 Song, Ruozhi, Wilmington, DE, United States
 Le, Dominique Hung Nhu, Upper Darby, PA, United States
 Vickery, Elsie Mae, Jenkintown, PA, United States
 PA Rohm and Haas Company, Philadelphia, PA, United States (U.S.
 corporation)
 PI US 6504053 B1 20030107
 AI US 2002-144924 20020514 (10) <--
 RLI Division of Ser. No. US 2001-928197, filed on 10 Aug 2001, now patented,
 Pat. No. US 6407280
 PRAI US 2001-286219P 20010425 (60) <--
 US 2000-236130P 20000928 (60) <--
 US 2000-235979P 20000928 (60) <--
 US 2000-236000P 20000928 (60) <--
 US 2000-235984P 20000928 (60) <--

DT Utility
 FS GRANTED
 EXNAM Primary Examiner: McKane, Joseph K.; Assistant Examiner: Saeed, Kamal
 LREP Holler, Alan
 CLMN Number of Claims: 2
 ECL Exemplary Claim: 1
 DRWN 0 Drawing Figure(s); 0 Drawing Page(s)
 LN.CNT 1489

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 146569-69-9P, Molybdenum nickel niobium tellurium vanadium oxide
 149920-42-3P, Molybdenum niobium palladium tellurium vanadium
 oxide 406681-66-1P 406681-67-2P 406681-68-3P
 (promoted multi-metal oxide oxidation or ammoxidn. catalysts for
 preparation of
 carboxylic acids or nitriles from alkanes and/or alkenes)

L51 ANSWER 18 OF 37 USPATFULL on STN
 AN 2002:323032 USPATFULL
 TI Annealed and promoted catalyst
 IN Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Heffner, Michele Doreen, Chalfont, PA, UNITED STATES
 Song, Ruozhi, Wilmington, DE, UNITED STATES
 PI US 2002183198 A1 20021205
 US 6645905 B2 20031111
 AI US 2002-117904 A1 20020408 (10) <--
 PRAI US 2001-286278P 20010425 (60) <--
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399
 CLMN Number of Claims: 12
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 1401

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A mixed metal oxide, which may be an orthorhombic phase material, is improved as a catalyst for the production of unsaturated carboxylic acids, or unsaturated nitriles, from alkanes, or mixtures of alkanes and alkenes, by: contacting with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture; recovering insoluble material from the contact mixture; calcining the recovered insoluble material in a non-oxidizing atmosphere; admixing the calcined recovered insoluble material with (i) at least one promoter element or compound thereof and (ii) at least one solvent for the at least one promoter element or compound thereof; removing the at least one solvent to form a catalyst precursor; and calcining the catalyst precursor.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 224324-44-1P, Molybdenum niobium samarium tellurium vanadium oxide
 (annealed and promoted catalyst for production of unsatd. carboxylic acids
 and nitriles)

L51 ANSWER 19 OF 37 USPATFULL on STN
 AN 2002:310893 USPATFULL
 TI Process for making highly active and selective catalysts for the production of unsaturated nitriles
 IN Abdulwahed, Mazhar, Damascus, SYRIAN ARAB REPUBLIC
 El-Yahyaoui, Khalid, Meknes, MOROCCO
 PA Saudi Basic Industries Corporation, Riyadh, SAUDI ARABIA (non-U.S. corporation)
 PI US 6486091 B1 20021126
 AI US 2000-675599 20000929 (9) <--
 PRAI US 2000-189215P 20000314 (60) <--
 DT Utility
 FS GRANTED
 EXNAM Primary Examiner: Silverman, Stanley S.; Assistant Examiner: Ildebrando, Christina
 LREP Kramer Levin Naftalis & Frankel LLP

CLMN Number of Claims: 40

ECL Exemplary Claim: 1

DRWN 0 Drawing Figure(s); 0 Drawing Page(s)

LN.CNT 565

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB An improved catalyst for the production of unsaturated nitrites from their corresponding olefins, the catalyst having the atomic ratios described by the empirical formula Bi._aMo._bV._cSb._dNb._eA._fB._gO._x and methods of making and using the same.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 260557-95-7

(highly active and selective catalysts for the production of unsatd. nitriles, methods of making and using the same)

L51 ANSWER 20 OF 37 USPATFULL on STN

AN 2002:283390 USPATFULL

TI Promoted multi-metal oxide catalyst

IN Bogan, Jr., Leonard Edward, Hatfield, PA, United States

PA Rohm and Haas Company, Philadelphia, PA, United States (U.S. corporation)

PI US 6472552 B1 20021029

AI US 2002-96018 20020312 (10) <--

RLI Division of Ser. No. US 2001-928022, filed on 9 Aug 2001, now patented, Pat. No. US 6383978

PRAI US 2001-286222P 20010425 (60) <--
US 2001-286218P 20010425 (60) <--

DT Utility

FS GRANTED

EXNAM Primary Examiner: Lambkin, Deborah C.; Assistant Examiner: Saeed, Kamal

LREP Holler, Alan

CLMN Number of Claims: 4

ECL Exemplary Claim: 1

DRWN 0 Drawing Figure(s); 0 Drawing Page(s)

LN.CNT 902

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A promoted multi-metal oxide catalyst is useful for the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, to an unsaturated carboxylic acid and for the vapor phase ammonoxidation of an alkane, or a mixture of an alkane and an alkene, to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 149920-40-1, Bismuth molybdenum niobium tellurium vanadium oxide

420134-66-3

(promoted mixed metal oxide catalyst for alkane oxidation to unsatd. nitrile)

L51 ANSWER 21 OF 37 USPATFULL on STN

AN 2002:259631 USPATFULL

TI Promoted multi-metal oxide catalyst

IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES

Gaffney, Anne Mae, West Chester, PA, UNITED STATES

Han, Scott, Lawrenceville, NJ, UNITED STATES

Heffner, Michele Doreen, Chalfont, PA, UNITED STATES

Song, Ruozhi, Wilmington, DE, UNITED STATES

PI US 2002143208 A1 20021003

US 6825380 B2 20041130

AI US 2002-95612 A1 20020312 (10) <--

RLI Division of Ser. No. US 2001-928030, filed on 11 Aug 2001, PENDING

PRAI US 2000-235982P 20000928 (60) <--
 US 2000-236073P 20000928 (60) <--
 US 2000-236305P 20000928 (60) <--
 US 2000-236250P 20000928 (60) <--
 US 2000-235983P 20000928 (60) <--

DT Utility

FS APPLICATION

LREP Alan Holler, Rohm and Haas Company - Patent Department, 100 Independence
Mall West, Philadelphia, PA, 19106-2399

CLMN Number of Claims: 10

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 1341

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 224324-37-2P, Molybdenum neodymium niobium tellurium vanadium oxide 224324-51-0P, Molybdenum niobium praseodymium tellurium vanadium oxide 224324-60-1P, Molybdenum niobium tellurium terbium vanadium oxide 224324-73-6P, Molybdenum niobium scandium tellurium vanadium oxide 406675-58-9P
(promoted multi-metal oxide catalysts for oxidation or ammoxidn. of alkanes and/or alkenes to carboxylic acids or nitriles)

L51 ANSWER 22 OF 37 USPATFULL on STN

AN 2002:243850 USPATFULL

TI Promoted multi-metal oxide catalyst

IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES

Gaffney, Anne Mae, West Chester, PA, UNITED STATES

Han, Scott, Lawrenceville, NJ, UNITED STATES

Vickery, Elsie Mae, Jenkintown, PA, UNITED STATES

PI US 2002133044 A1 20020919 <--

US 6797840 B2 20040928

AI US 2002-95633 A1 20020312 (10) <--

RLI Division of Ser. No. US 2001-928020, filed on 10 Aug 2001, PENDING

PRAI US 2000-236112P 20000928 (60) <--

US 2001-283245P 20010412 (60) <--

DT Utility

FS APPLICATION

LREP Alan Holler, Rohm and Haas Company - Patent Department, 100 Independence
Mall West, Philadelphia, PA, 19106-2399

CLMN Number of Claims: 10

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 1218.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising an In promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane, or a mixture of an alkane and an alkene, to an unsaturated nitrile

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 406675-87-4P 406675-88-5P

(promoted multi-metal oxide oxidation catalyst)

L51 ANSWER 23 OF 37 USPATFULL on STN
 AN 2002:141641 USPATFULL
 TI Zn and/or Ga promoted multi-metal oxide catalyst
 IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES
 Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Han, Scott, Lawrenceville, NJ, UNITED STATES
 Le, Dominique Hung Nhu, Upper Darby, PA, UNITED STATES
 PI US 2002072629 A1 20020613 <--
 US 6589907 B2 20030708 <--
 AI US 2001-928019 A1 20010810 (9) <--
 PRAI US 2000-235978P 20000928 (60) <--
 US 2000-236129P 20000928 (60) <--
 US 2000-236260P 20000928 (60) <--
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399
 CLMN Number of Claims: 10
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 1437

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 406675-48-7P 406675-50-1P
 (zinc and/or gallium promoted multi-metal oxide oxidation and ammoxidn.
 catalyst)

L51 ANSWER 24 OF 37 USPATFULL on STN
 AN 2002:126913 USPATFULL
 TI Promoted multi-metal oxide catalyst
 IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES
 Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Han, Scott, Lawrenceville, NJ, UNITED STATES
 Heffner, Michele Doreen, Chalfont, PA, UNITED STATES
 Song, Ruozhi, Wilmington, DE, UNITED STATES
 Nhu Le, Dominique Hung, Upper Darby, PA, UNITED STATES
 Vickery, Elsie Mae, Jenkintown, PA, UNITED STATES
 PI US 2002065431 A1 20020530 <--
 US 6407280 B2 20020618 <--
 AI US 2001-928197 A1 20010810 (9) <--
 PRAI US 2000-236130P 20000928 (60) <--
 US 2000-235979P 20000928 (60) <--
 US 2000-236000P 20000928 (60) <--
 US 2000-235984P 20000928 (60) <--
 US 2001-286219P 20010425 (60) <--
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399
 CLMN Number of Claims: 10
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 1579

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 146569-69-9P, Molybdenum nickel niobium tellurium vanadium oxide
149920-42-3P, Molybdenum niobium palladium tellurium vanadium
oxide 406681-66-1P 406681-67-2P 406681-68-3P
(promoted multi-metal oxide oxidation or ammoxidn. catalysts for preparation of carboxylic acids or nitriles from alkanes and/or alkenes)

L51 ANSWER 25 OF 37 USPATFULL on STN

AN 2002:120053 USPATFULL

TI PROMOTED MULTI-METAL OXIDE CATALYST

IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES

Gaffney, Anne Mae, West Chester, PA, UNITED STATES

Han, Scott, Lawrenceville, NJ, UNITED STATES

Heffner, Michele Doreen, Chalfont, PA, UNITED STATES

Song, Ruozhi, Wilmington, DE, UNITED STATES

PI US 2002062042 A1 20020523 <--

US 6407031 B2 20020618

AI US 2001-928030 A1 20010811 (9) <--

PRAI US 2000-235982P 20000928 (60) <--

US 2000-236073P 20000928 (60) <--

US 2000-236305P 20000928 (60) <--

US 2000-236250P 20000928 (60) <--

US 2000-235983P 20000928 (60) <--

DT Utility

FS APPLICATION

LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
PHILADELPHIA, PA, 19106-2399

CLMN Number of Claims: 10

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 1342

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 224324-37-2P, Molybdenum neodymium niobium tellurium vanadium

oxide 224324-51-0P, Molybdenum niobium praseodymium tellurium

vanadium oxide 224324-60-1P, Molybdenum niobium tellurium

terbium vanadium oxide 224324-73-6P, Molybdenum niobium

scandium tellurium vanadium oxide 406675-58-9P

(promoted multi-metal oxide catalysts for oxidation or ammoxidn. of alkanes and/or alkenes to carboxylic acids or nitriles)

L51 ANSWER 26 OF 37 USPATFULL on STN

AN 2002:120049 USPATFULL

TI Ir and/or Sm promoted multi-metal oxide catalyst

IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES

Gaffney, Anne Mae, West Chester, PA, UNITED STATES

Han, Scott, Lawrenceville, NJ, UNITED STATES
 Heffner, Michele Doreen, Chalfont, PA, UNITED STATES
Song, Ruozhi, Wilmington, DE, UNITED STATES

PI US 2002062038 A1 20020523 <--
 US 6734136 B2 20040511

AI US 2001-927288 A1 20010810 (9) <--

PRAI US 2000-235980P 20000928 (60) <--

US 2000-235981P 20000928 (60) <--

US 2000-236143P 20000929 (60) <--

DT Utility

FS APPLICATION

LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399

CLMN Number of Claims: 10

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 1170

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 224324-44-1P, Molybdenum niobium samarium tellurium vanadium oxide
 406675-66-9P

(iridium and/or samarium promoted multi-metal oxide oxidation and
 ammoxidn. catalysts)

L51 ANSWER 27 OF 37 USPATFULL on STN

AN 2002:113088 USPATFULL

TI PROMOTED MULTI-METAL OXIDE CATALYST

IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES

Gaffney, Anne Mae, West Chester, PA, UNITED STATES

Han, Scott, Lawrenceville, NJ, UNITED STATES

Vickery, Elsie Mae, Jenkintown, PA, UNITED STATES

PI US 2002058836 A1 20020516 <--

US 6403525 B2 20020611

AI US 2001-928020 A1 20010810 (9) <--

PRAI US 2000-236112P 20000928 (60) <--

US 2001-283245P 20010412 (60) <--

DT Utility

FS APPLICATION

LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399

CLMN Number of Claims: 10

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 1223

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst comprising an In promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane, or a mixture of an alkane and an alkene, to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 406675-87-4P 406675-88-5P

(promoted multi-metal oxide oxidation catalyst)

L51 ANSWER 28 OF 37 USPATFULL on STN
 AN 2002:113087 USPATFULL
 TI Halogen promoted multi-metal oxide catalyst
 IN Chaturvedi, Sanjay, Horsham, PA, UNITED STATES
 Gaffney, Anne Mae, West Chester, PA, UNITED STATES
 Han, Scott, Lawrenceville, NJ, UNITED STATES
 Heffner, Michele Doreen, Chalfont, PA, UNITED STATES
 Song, Ruozhi, Wilmington, DE, UNITED STATES
 PI US 2002058835 A1 20020516 <--
 US 6461996 B2 20021008
 AI US 2001-927941 A1 20010810 (9) <--
 PRAI US 2000-236261P 20000928 (60) <--
 US 2000-235977P 20000928 (60) <--
 US 2000-236263P 20000928 (60) <--
 US 2000-236262P 20000928 (60) <--
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399
 CLMN Number of Claims: 14
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 1270
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.
 AB A catalyst comprising a promoted mixed metal oxide is useful for the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane or a mixture of an alkane and an alkene to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.
 IT 406675-79-4P 406675-80-7P 406675-81-8P
 406675-82-9P
 (halogen promoted multi-metal oxide oxidation and ammoxidn. catalysts)

L51 ANSWER 29 OF 37 USPATFULL on STN
 AN 2002:102444 USPATFULL
 TI Promoted multi-metal oxide catalyst
 IN Bogan, Jr., Leonard Edward, Hatfield, PA, United States
 PA Rohm and Haas Company, Philadelphia, PA, United States (U.S.
 corporation)
 PI US 6383978 B1 20020507 <--
 AI US 2001-928022 20010809 (9) <--
 PRAI US 2001-286222P 20010425 (60) <--
 US 2001-286218P 20010425 (60) <--
 DT Utility
 FS GRANTED
 EXNAM Primary Examiner: Higel, Floyd D.; Assistant Examiner: Saeed, Kamal
 LREP Holler, Alan
 CLMN Number of Claims: 6
 ECL Exemplary Claim: 1
 DRWN 0 Drawing Figure(s); 0 Drawing Page(s)
 LN.CNT 868
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.
 AB A promoted multi-metal oxide catalyst is useful for the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, to an unsaturated carboxylic acid and for the vapor phase ammoxidation of an alkane, or a mixture of an alkane and an alkene, to an unsaturated nitrile.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 149920-40-1, Bismuth molybdenum niobium tellurium vanadium oxide
420134-66-3
(promoted mixed metal oxide catalyst for alkane oxidation to unsatd.
nitrile)

L51 ANSWER 30 OF 37 USPATFULL on STN
 AN 2002:17484 USPATFULL
 TI Process for preparing a catalyst and catalytic oxidation therewith
 IN Lin, Manhua, Maple Glen, PA, UNITED STATES
 PI US 2002010365 A1 20020124 <--
 US 6693059 B2 20040217
 AI US 2001-754942 A1 20010104 (9) <--
 PRAI US 2000-181412P 20000209 (60) <--
 DT Utility
 FS APPLICATION
 LREP Alan Holler, Rohm and Haas Company, 100 Independence Mall West,
 Philadelphia, PA, 19106-2399
 CLMN Number of Claims: 10
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 571

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process useful for the catalytic gas phase oxidation of alkanes to
 unsaturated aldehydes or carboxylic acids uses catalysts of particular
 compositions formed in a particular manner.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 204125-27-9P, Molybdenum niobium tellurium tungsten vanadium oxide
 (catalyst; preparation of alkane oxidation catalyst)

L51 ANSWER 31 OF 37 USPATFULL on STN
 AN 2000:128267 USPATFULL
 TI Highly active and selective catalysts for the production of unsaturated
 nitriles, methods of making and using the same
 IN Abdulwahed, Mazhar, Damascus, Syria
 El Yahyaoui, Khalid, Meknes, Morocco
 PA Saudi Basic Industries Corporation, Saudi Arabia (non-U.S. corporation)
 PI US 6124233 20000926 <--
 AI US 1999-431744 19991101 (9) <--
 RLI Division of Ser. No. US 1999-228885, filed on 11 Jan 1999
 DT Utility
 FS Granted
 EXNAM Primary Examiner: McKane, Joseph; Assistant Examiner: Murray, Joseph
 LREP Whitman Breed Abbott & Morgan LLP
 CLMN Number of Claims: 21
 ECL Exemplary Claim: 1
 DRWN 1 Drawing Figure(s); 1 Drawing Page(s)
 LN.CNT 339

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB An improved catalyst for the production of unsaturated nitriles from
 their corresponding olefins, the catalyst having the atomic ratios
 described by the empirical formula Bi_aMo_bV_cSb_dNb_eA_fB_gO_x and methods of using the same.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 260557-95-7
 (highly active and selective catalysts for the production of unsatd.
 nitriles, methods of making and using the same)

L51 ANSWER 32 OF 37 USPATFULL on STN
 AN 2000:57716 USPATFULL
 TI Process for producing acrylic acid
 IN Takahashi, Mamoru, Aichi, Japan
 Tu, Xinlin, Aichi, Japan
 Hirose, Toshiro, Aichi, Japan
 Ishii, Masakazu, Aichi, Japan
 PA Toagosei Co., Ltd., Tokyo, Japan (non-U.S. corporation)
 PI US 6060422 20000509 <--
 AI US 1999-339230 19990624 (9) <--
 RLI Division of Ser. No. US 1997-955246, filed on 21 Oct 1997, now patented,
 Pat. No. US 5994580, issued on 30 Nov 1999
 PRAI JP 1996-297755 19961021 <--
 JP 1997-54200 19970221 <--
 DT Utility
 FS Granted
 EXNAM Primary Examiner: Dunn, Tom; Assistant Examiner: Nguyen, Cam N.
 LREP Sughrue, Mion, Zinn, Macpeak & Seas, PLLC
 CLMN Number of Claims: 3
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 720

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process for producing acrylic acid from propane and oxygen gas through a vapor-phase catalytic oxidation reaction, said process comprising conducting the reaction using as a catalyst a metal oxide containing metallic elements Mo, V, Sb, and A (provided that A is at least one element selected from the group consisting of Nb, Ta, Sn, W, Ti, Ni, Fe, Cr, and Co). The metal oxide is prepared by a process including specific steps (1) and (2). The metal oxide may be supported on a compound containing specific elements.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 207615-99-4P 207616-00-0P 207616-02-2P
 (preparation of acrylic acid from propane using mixed metal oxide catalysts)

L51 ANSWER 33 OF 37 USPATFULL on STN
 AN 2000:37742 USPATFULL
 TI Ammonoxidation catalyst for use in producing acrylonitrile or methacrylonitrile from propane or isobutane by ammonoxidation
 IN Komada, Satoru, Yokohama, Japan
 Hamada, Kazuyuki, Kurashiki, Japan
 PA Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan (non-U.S. corporation)
 PI US 6043186 20000328 <--
 AI US 1998-172648 19981015 (9) <--
 PRAI JP 1997-282304 19971015 <--
 DT Utility
 FS Granted
 EXNAM Primary Examiner: Niebling, John F.; Assistant Examiner: Ghyka, Alexander G.
 CLMN Number of Claims: 8
 ECL Exemplary Claim: 1
 DRWN 1 Drawing Figure(s); 1 Drawing Page(s)
 LN.CNT 1214

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB An ammonoxidation catalyst comprising a compound oxide which contains, in specific atomic ratios, molybdenum; vanadium; niobium; at least one element selected from tellurium and antimony; and at least one element selected from ytterbium, dysprosium, erbium, neodymium, samarium,

lanthanum, praseodymium, europium, gadolinium, terbium, holmium, thulium, lutetium and scandium. By the use of the ammoxidation catalyst of the present invention, the ammonia-based yield of acrylonitrile or methacrylonitrile can be largely increased without sacrificing the propane- or isobutane-based yield of acrylonitrile or methacrylonitrile. Thus, the feed-stock ammonia can be efficiently utilized in the ammoxidation of propane or isobutane while achieving an efficient utilization of propane or isobutane.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 224324-37-2P 224324-44-1P 224324-48-5P
 224324-51-0P 224324-60-1P 224324-73-6P
 (ammoxidn. catalysts for manufacture of (meth)acrylonitrile)

L51 ANSWER 34 OF 37 USPATFULL on STN
 AN 2000:37741 USPATFULL
 TI Gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidation
 IN Cirjak, Larry M., Burton Township, OH, United States
 Venturelli, Anne, North Royalton, OH, United States
 Cassidy, Timothy J., Buxton, United Kingdom
 Pepera, Marc A., Northfield Center Township, OH, United States
 Drenski, Tama L., Twinsburg, OH, United States
 PA The Standard Oil Company, Chicago, IL, United States (U.S. corporation)
 PI US 6043185 20000328 <--
 AI US 1999-285384 19990402 (9) <--
 DT Utility
 FS Granted
 EXNAM Primary Examiner: Richter, Johann; Assistant Examiner: Murray, Joseph
 LREP Yusko, David P., Oliver, Wallace L.
 CLMN Number of Claims: 18
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 460

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst useful in the manufacture of acrylonitrile or methacrylonitrile by the catalytic reaction in the vapor phase of a paraffin selected from propane and isobutane with molecular oxygen and ammonia by catalytic contact of the reactants in a reaction zone with a catalyst, the feed composition having a mole ratio of the paraffin to ammonia in the range of about 1.0 to 10 and a mole ratio of paraffin to oxygen in the range of about 1.0 to 10, wherein said catalyst has the elements in the proportions indicated by the empirical formula:

MO._a V._b Sb._c Ga._d X._e O._x

where

X is one or more of As, Te, Se, Nb, Ta, W, Ti, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pd, Pt, B, In, Ce, Re, Ir, Ge, Sn, Bi, Y, Pr, an alkali metal, and an alkaline earth metal, preferably Nb, Ce, Fe, Ge, Sn, In, As, Se, and B, especially preferred being Nb,

a equals 1,

b equals 0.0 to 0.99, preferably 0.1 to 0.5,

c equals 0.01 to 0.9, preferably 0.05 to 0.5,

d equals 0.01 to 0.5, preferably 0.01 to 0.4,

e equals 0.0 to 1.0, preferably 0.0 to 0.9,

x is determined by the oxidation state of the cations present.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 261919-86-2

(gallium promoted molybdenum vanadium-antimony-oxide based catalyst for selective paraffin ammoxidn.)

L51 ANSWER 35 OF 37 USPATFULL on STN

AN 2000:31378 USPATFULL

TI Highly active and selective catalysts for the production of unsaturated nitriles, methods of making and using the same

IN Abdulwahed, Mazhar, Syria, Syria
Yahyaoui, Khalid El, Meknes, Morocco

PA Saudi Basic Industries Corporation, Saudi Arabia (non-U.S. corporation)

PI US 6037304 20000314 <--

AI US 1999-228885 19990111 (9) <--

DT Utility

FS Granted

EXNAM Primary Examiner: Bell, Mark L.; Assistant Examiner: Hailey, Patricia L.

LREP Whitman Breed Abbott & Morgan LLP

CLMN Number of Claims: 10

ECL Exemplary Claim: 1

DRWN 1 Drawing Figure(s); 1 Drawing Page(s)

LN.CNT 317

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB An improved catalyst for the production of unsaturated nitrites from their corresponding olefins, the catalyst having the atomic ratios described by the empirical formula Bi_aMo_bV_cSb_dNb_eA_fB_gO_x and methods of using the same.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 260557-95-7

(highly active and selective catalysts for the production of unsatd. nitriles, methods of making and using the same)

L51 ANSWER 36 OF 37 USPATFULL on STN

AN 1999:155962 USPATFULL

TI Process for producing acrylic acid

IN Takahashi, Mamoru, Aichi, Japan

Tu, Xinlin, Aichi, Japan

Hirose, Toshiro, Aichi, Japan

Ishii, Masakazu, Aichi, Japan

PA Toagosei Co., Ltd., Tokyo, Japan (non-U.S. corporation)

PI US 5994580 19991130 <--

AI US 1997-955246 19971021 (8) <--

PRAI JP 1996-297755 19961021 <--

JP 1997-54200 19970212 <--

DT Utility

FS Granted

EXNAM Primary Examiner: Barts, Samuel; Assistant Examiner: Keys, Rosalynd

LREP Sughrue, Mion, Zinn, Macpeak & Seas, PLLC

CLMN Number of Claims: 4

ECL Exemplary Claim: 1

DRWN No Drawings

LN.CNT 712

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process for producing acrylic acid from propane and oxygen gas through

satisfied; and

2 the catalyst has X-ray diffraction peaks at the following angles of 2θ in its X-ray diffraction pattern:

Diffraction

angles of 2θ ($^{\circ}$)

22.1 ± 0.3

28.2 ± 0.3

36.2 ± 0.3

45.2 ± 0.3

50.0 ± 0.3 .

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 149920-42-3, Molybdenum niobium palladium tellurium vanadium oxide
(molybdenum oxide ammoxidn. catalyst for the production of nitriles)

=> d 152 bib abs hitrn tot

L52 ANSWER 1 OF 7 USPATFULL on STN

AN 2005:23396 USPATFULL

TI Methods and systems for high throughput analysis

IN Linsen, Michael William, North Wales, PA, UNITED STATES

Schmitt, Edward Albert, UNITED STATES

Schure, Mark Richard, UNITED STATES

PI US 2005019940 A1 20050127

AI US 2004-910974 A1 20040804 (10)

RLI Division of Ser. No. US 2002-307654, filed on 2 Dec 2002, PENDING

PRAI US 2001-339903P 20011217 (60)

DT Utility

FS APPLICATION

LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
PHILADELPHIA, PA, 19106-2399

CLMN Number of Claims: 16

ECL Exemplary Claim: CLM-01-21

DRWN 10 Drawing Page(s)

LN.CNT 851

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Methods of analyzing processes for making catalysts and/or certain properties of catalysts using a plurality of reaction zones are provided. The methods of the present invention have the capability to define and execute, in rapid succession, a plurality of experiments under disparate reaction conditions. An operator may define and execute a plurality of experiments on user-defined quantities of disparate catalysts, using user-defined input feeds, residence times, and temperature profiles.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 261919-86-2 406675-87-4

(high throughput anal. of catalysts for conversion of propane to acrylic acid)

L52 ANSWER 2 OF 7 USPATFULL on STN

AN 2004:315527 USPATFULL
 TI Ethane oxidation catalyst and process utilising the catalyst
 IN Ellis, Brian, Lower Sunbury, UNITED KINGDOM
 PI US 2004249204 A1 20041209
 AI US 2004-491287 A1 20040331 (10)
 WO 2002-GB4018 20020904
 PRAI GB 2001-24835 20011016
 DT Utility
 FS APPLICATION
 LREP NIXON & VANDERHYE, PC, 1100 N GLEBE ROAD, 8TH FLOOR, ARLINGTON, VA,
 22201-4714
 CLMN Number of Claims: 12
 ECL Exemplary Claim: 1
 DRWN No Drawings
 LN.CNT 402

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A catalyst composition and its use for the selective oxidation of ethane to acetic acid and/or for the selective oxidation of ethylene to acetic acid which composition comprises in combination with oxygen the elements molybdenum, vanadium, niobium, gold in the absence of palladium according to the empirical formula: Mo._aW._bAu._cV._dNb._eZ._f wherein Z is one or more elements selected from the group consisting of B, Al, Ga, In, Ge, Sn, Pb, Sb, Cu, Pt, Ag, Fe and Re; a, b, c, d, e and f represent the gram atom ratios of the elements such that: 0<a≤1; 0≤b<1 and a+b=1; 10.⁻⁵≤c≤0.02; 0<d≤2; 0<e≤1; and 0.0001≤f≤0.05.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 511313-29-4
 (ethane oxidation catalyst for acetic acid manufacture)

L52 ANSWER 3 OF 7 USPATFULL on STN
 AN 2003:182049 USPATFULL
 TI Methods and systems for high throughput analysis
 IN Linsen, Michael William, North Wales, PA, UNITED STATES
 Schmitt, Edward Albert, UNITED STATES
 Schure, Mark Richard, UNITED STATES
 PI US 2003125884 A1 20030703
 US 6901334 B2 20050531
 AI US 2002-307654 A1 20021202 (10)
 PRAI US 2001-339903P 20011217 (60)
 DT Utility
 FS APPLICATION
 LREP ROHM AND HAAS COMPANY, PATENT DEPARTMENT, 100 INDEPENDENCE MALL WEST,
 PHILADELPHIA, PA, 19106-2399
 CLMN Number of Claims: 36
 ECL Exemplary Claim: 1
 DRWN 10 Drawing Page(s)
 LN.CNT 1019

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Methods of analyzing processes for making catalysts and/or certain properties of catalysts using a plurality of reaction zones are provided. The methods of the present invention have the capability to define and execute, in rapid succession, a plurality of experiments under disparate reaction conditions. An operator may define and execute a plurality of experiments on user-defined quantities of disparate catalysts, using user-defined input feeds, residence times, and temperature profiles.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 261919-86-2 406675-87-4
 (high throughput anal. of catalysts for conversion of propane to acrylic acid)

L52 ANSWER 4 OF 7 USPATFULL on STN
 AN 2000:174867 USPATFULL
 TI Process for the simultaneous preparation of acrylonitrile and acrylic acid
 IN Kayou, Atsushi, Okayama, Japan
 Ihara, Tatsuya, Okayama, Japan
 PA Mitsubishi Chemical Corporation, Tokyo, Japan (non-U.S. corporation)
 PI US 6166241 20001226
 WO 9822421 19980528
 AI US 1999-284993 19990513 (9)
 WO 1997-JP4169 19971117
 19990513 PCT 371 date
 19990513 PCT 102(e) date
 PRAI JP 1996-304502 19961115
 DT Utility
 FS Granted
 EXNAM Primary Examiner: Tsang, Cecilia; Assistant Examiner: Murray, Joseph
 LREP Oblon, Spivak, McClelland, Maier & Neustadt, P.C.
 CLMN Number of Claims: 13
 ECL Exemplary Claim: 1
 DRWN 2 Drawing Figure(s); 2 Drawing Page(s)
 LN.CNT 627
 CAS INDEXING IS AVAILABLE FOR THIS PATENT.
 AB The present invention relates to a method for the simultaneous production of acrylonitrile and acrylic acid by reacting propane with ammonia and oxygen in the gas phase catalytic oxidation in the presence of a metal oxide catalyst containing vanadium and at least one member selected from tellurium, antimony and molybdenum and adjusting the molar ratio of propane to ammonia to from 2 to 10 and the molar ratio of oxygen to ammonia to from 2 to 10.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 146569-65-5
 (simultaneous preparation of acrylonitrile and acrylic acid by gas-phase catalytic oxidation of propane)

L52 ANSWER 5 OF 7 USPATFULL on STN
 AN 95:4048 USPATFULL
 TI Method for producing an unsaturated carboxylic acid
 IN Ushikubo, Takashi, Yokohama, Japan
 Nakamura, Hiroya, Yokohama, Japan
 Koyasu, Yukio, Tokyo, Japan
 Wajiki, Shin, Tokyo, Japan
 PA Mitsubishi Kasei Corporation, Tokyo, Japan (non-U.S. corporation)
 PI US 5380933 19950110
 AI US 1994-187719 19940128 (8)
 PRAI JP 1993-12616 19930128
 JP 1993-153651 19930624
 JP 1993-308013 19931208
 DT Utility
 FS Granted
 EXNAM Primary Examiner: Prescott, Arthur C.
 LREP Oblon, Spivak, McClelland, Maier & Neustadt
 CLMN Number of Claims: 13
 ECL Exemplary Claim: 1
 DRWN No Drawings

LN.CNT 556

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A method for producing an unsaturated carboxylic acid, which comprises subjecting an alkane to a vapor phase catalytic oxidation reaction in the presence of a catalyst containing a mixed metal oxide comprising, as essential components, Mo, V, Te, O and X wherein X is at least one element selected from the group consisting of niobium, tantalum, tungsten, titanium, aluminum, zirconium, chromium, manganese, iron, ruthenium, cobalt, rhodium, nickel, palladium, platinum, antimony, bismuth, boron, indium and cerium, wherein the proportions of the respective essential components, based on the total amount of the essential components exclusive of oxygen, satisfy the following formulas:

$$0.25 < r_{\text{sub.Mo}} < 0.98$$

$$0.003 < r_{\text{sub.V}} < 0.5$$

$$0.003 < r_{\text{sub.Te}} < 0.5$$

$$0.003 < r_{\text{sub.X}} < 0.5$$

wherein $r_{\text{sub.Mo}}$, $r_{\text{sub.V}}$, $r_{\text{sub.Te}}$ and $r_{\text{sub.X}}$ are molar fractions of Mo, V, Te and X, respectively, based on the total amount of the essential components exclusive of oxygen.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 149920-40-1, Bismuth molybdenum niobium tellurium vanadium oxide
(catalyst for conversion to acrylic acid)

L52 ANSWER 6 OF 7 USPATFULL on STN

AN 94:7838 USPATFULL

TI Process for producing nitriles

IN Ushikubo, Takashi, Yokohama, Japan

Oshima, Kazunori, Tokyo, Japan

Kayo, Atsushi, Kurashiki, Japan

Umezawa, Tiaki, Yokkaichi, Japan

Kiyono, Ken-ichi, Tokyo, Japan

Sawaki, Itaru, Yokkaichi, Japan

PA Mitsubishi Kasei Corporation, Tokyo, Japan (non-U.S. corporation)

PI US 5281745 19940125

AI US 1992-926173 19920807 (7)

PRAI JP 1991-199573 19910808

JP 1992-18962 19920204

DT Utility

FS Granted

EXNAM Primary Examiner: Brust, Joseph Paul

LREP Oblon, Spivak, McClelland, Maier & Neustadt

CLMN Number of Claims: 12

ECL Exemplary Claim: 1

DRWN 2 Drawing Figure(s); 2 Drawing Page(s)

LN.CNT 1434

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process for producing a nitrile, which comprises subjecting an alkane and ammonia in the gaseous state to catalytic oxidation in the presence of a catalyst which satisfies the following conditions of (1) and (2):

(1) the catalyst is represented by the empirical formula:

Mo._a V._b Te._c X._x O._n

(1)

wherein X is at least one element selected from the group consisting of Nb, Ta, W, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pd, Pt, Sb, Bi, B and Ce,

when a = 1,
b = 0.01 to 1.0,
c = 0.01 to 1.0,
x = 0.01 to 1.0,

and n is a number such that the total valency of the metal elements is satisfied; and

(2) the catalyst has X-ray diffraction peaks at the following angles of 2θ in its X-ray diffraction pattern:

Diffraction angles of 2θ ($^{\circ}$)		
	22.1 \pm 0.3	28.2 \pm 0.3
36.2 \pm 0.3	45.2 \pm 0.3	50.0 \pm
0.3.		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 149920-38-7 149920-40-1 149920-41-2

149920-42-3

(catalysts, for ammonoxidn. of alkanes with air and ammonia)

L52 ANSWER 7 OF 7 USPATFULL on STN
 AN 93:61222 USPATFULL
 TI Process for producing nitriles
 IN Ushikubo, Takashi, Yokohama, Japan
 Oshima, Kazunori, Machida, Japan
 Umezawa, Tiaki, Yokkaichi, Japan
 Kiyono, Ken-ichi, Machida, Japan
 PA Mitsubishi Kasei Corporation, Tokyo, Japan (non-U.S. corporation)
 PI US 5231214 19930727
 AI US 1992-880687 19920508 (7)

PRAI JP 1991-104382 19910509
 DT Utility
 FS Granted

EXNAM Primary Examiner: Brust, Joseph Paul
 LREP Oblon, Spivak, McClelland, Maier & Neustadt
 CLMN Number of Claims: 11

ECL Exemplary Claim: 1
 DRWN No Drawings

LN.CNT 602

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process for producing a nitrile, which comprises subjecting an alkane and ammonia in the gaseous state to catalytic oxidation in the presence of an oxide of the formula:

Mo._a V._b Te._c Nb._d X._x O._n (1)

wherein X is at least one element selected from the group consisting of Mg, Ca, Sr, Ba, Al, Ga, Tl, In, Ti, Zr, Hf, Ta, Cr, Mn, W, Fe, Ru, Co, Rh, Ni, Pd, Pt, Zn, Sn, Pb, As, Sb, Bi, La and Ce,

when a=1,

b=0.01 to 1.0,

c=0.01 to 1.0,

d=0 to 1.0, and

x=0.0005 to 1.0,

and n is a number such that the total valency of the metal elements is satisfied.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

IT 146569-65-5 146569-67-7 146569-68-8

146569-69-9 146569-70-2

(catalyst, for ammoniadn. of propane)

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(FILE 'HOME' ENTERED AT 13:34:26 ON 19 JUL 2005)
SET COST OFF

FILE 'HCAPLUS' ENTERED AT 13:34:33 ON 19 JUL 2005

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L2	110 S E3,E4,E10,E11,E14,E15 E SONG R/AU
L3	65 S E3-E9 E SONG RUO/AU
L4	25 S E3,E10
L5	8568 S ((ROHM? OR ROEHM?) (L) HAAS?)/PA,CS
L6	51 S L2-L4 AND CATALY?/SC,SX
L7	94 S L2-L4 AND CATALY?/CW,CT
L8	91 S L2-L4 AND CAT/RL
L9	108 S L6-L8
L10	1 S L1 AND L2-L9 SEL RN

FILE 'REGISTRY' ENTERED AT 13:38:38 ON 19 JUL 2005

L11	46 S E1-E46
L12	26 S L11 NOT TIS/CI
L13	20 S L11 NOT L12
L14	156 S (MO AND V AND NB AND O)/ELS AND (TE OR SB)/ELS
L15	75 S L14 AND 6/ELC.SUB
L16	125 S L14 AND (LI OR NA OR K OR RB OR CS OR MG OR CA OR SR OR BA OR
L17	33 S L14 AND (BI OR SE OR F OR CL OR BR OR I OR PR OR ND OR SM OR
L18	135 S L16,L17
L19	63 S L18 AND L15
L20	20 S L13 AND L19
L21	43 S L19 NOT L20
L22	25 S L21 AND SB/ELS
L23	4 S L22 AND (TL OR GE OR AL OR SN)/ELS
L24	21 S L22 NOT L23
L25	18 S L21 NOT L22
L26	59 S L20,L24,L25
L27	76 S L18 NOT L26 SAV L26 SACKY676/A

FILE 'HCAOLD' ENTERED AT 14:14:48 ON 19 JUL 2005

L28 0 S L26

FILE 'HCAPLUS' ENTERED AT 14:14:53 ON 19 JUL 2005

L29 51 S L26
L30 28 S L26 (L) PREP+NT/RL
L31 11 S L1-L10 AND L30
L32 46 S L29 AND (PD<=20021001 OR PRD<=20021001 OR AD<=20021001)
L33 26 S L30 AND L32
L34 10 S L31 AND L32
L35 1 S L31 NOT L34
L36 11 S L31,L34,L35
L37 27 S L33,L36
L38 20 S L32 NOT L37

FILE 'USPATFULL' ENTERED AT 14:20:33 ON 19 JUL 2005

L39 44 S L26
L40 0 S L39 AND B01J037/IPC
L41 32 S L39 AND B01J/IPC
L42 41 S L39 AND (PD<=20021001 OR PRD<=20021001 OR AD<=20021001)
L43 19 S L39 AND (GAFFNEY ? OR SONG ?)/AU
L44 3 S L39 AND (ROHM? OR ROEHM?)/PA
L45 29 S L41 AND L42
L46 31 S L43,L44,L45
L47 13 S L39,L42 NOT L46

FILE 'REGISTRY' ENTERED AT 14:23:31 ON 19 JUL 2005

FILE 'HCAPLUS' ENTERED AT 14:25:39 ON 19 JUL 2005

FILE 'USPATFULL' ENTERED AT 14:26:43 ON 19 JUL 2005

L48 29 S L26/P
L49 27 S L48 AND L42
L50 29 S L48,L49
L51 37 S L50,L46
L52 7 S L39 NOT L51

=>

=> fil wpix
FILE 'WPIX' ENTERED AT 14:55:47 ON 19 JUL 2005
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FILE LAST UPDATED: 15 JUL 2005 <20050715/UP>
MOST RECENT DERWENT UPDATE: 200545 <200545/DW>
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FOR DETAILS. <<<

=> d his

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SET COST OFF

FILE 'WPIX' ENTERED AT 14:34:40 ON 19 JUL 2005

L1	10808 S B01J037/IPC
L2	234 S B01J023-28/IPC AND L1
L3	42 S L2 AND B01J037-04/IPC
L4	53 S L2 AND B01J037-08/IPC
L5	12 S L2 AND B01J037-10/IPC
L6	1 S L3 AND L4 AND L5
L7	18 S L3 AND L4,L5
L8	3 S L4 AND L5
L9	19 S L7,L8 NOT L6
L10	7978 S N06-E?/MC
L11	17059 S L1,L10
L12	302 S B01J023-28/IPC AND L11
L13	1255 S (N03-D02 OR N03-D)/MC AND L11
L14	926 S (M25-G18 OR B04-A03B OR C05-A03B OR E35-Q OR E05-M)/MC AND L1
L15	2069 S L12-L14
L16	163 S L15 AND B01J037-04/IPC
L17	163 S L15 AND B01J037-08/IPC
L18	30 S L15 AND B01J037-10/IPC
L19	1 S L16 AND L17 AND L18
L20	136 S L15 AND ("E11-E" OR N07-C)/MC
L21	48 S L15 AND E31-G/MC
L22	95 S L15 AND (E31-M OR E05-J)/MC
L23	113 S L21,L22
L24	23 S L23 AND L16

L25 8 S L24 AND L17
 L26 1 S L24 AND L18
 L27 8 S L25,L26
 L28 7 S L27 NOT L19
 L29 15 S L24 NOT L25-L28

FILE 'WPIX' ENTERED AT 14:55:47 ON 19 JUL 2005

=> d all abeq tech abex tot 128

L28 ANSWER 1 OF 7 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2003-259117 [26] WPIX
 DNC C2003-067733
 TI Catalyst for forming unsaturated carboxylic acid and unsaturated nitrile, comprising mixed metal oxide is new.
 DC A41 E16
 IN GAFFNEY, A M; SONG, R
 PA (ROHM) ROHM & HAAS CO; (GAFF-I) GAFFNEY A M; (SONG-I) SONG R
 CYC 31
 PI EP 1270068 A1 20030102 (200326)* EN 22 B01J023-22
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
 RO SE SI TR
 US 2003004379 A1 20030102 (200326) B01J023-22
 BR 2002002283 A 20030422 (200330) B01J027-02
 JP 2003088758 A 20030325 (200330) 20 B01J027-057
 KR 2002096982 A 20021231 (200330) B01J023-64
 CN 1395997 A 20030212 (200335) B01J027-057
 US 6746983 B2 20040608 (200437) B01J023-00
 US 2004181084 A1 20040916 (200461) C07C253-34
 ADT EP 1270068 A1 EP 2002-253989 20020607; US 2003004379 A1 Provisional US
 2001-299213P 20010618, US 2002-165892 20020610; BR 2002002283 A BR
 2002-2283 20020617; JP 2003088758 A JP 2002-176924 20020618; KR 2002096982
 A KR 2002-34031 20020618; CN 1395997 A CN 2002-122658 20020618; US 6746983
 B2 Provisional US 2001-299213P 20010618, US 2002-165892 20020610; US
 2004181084 A1 Provisional US 2001-299213P 20010618, Div ex US 2002-165892
 20020610, US 2004-806582 20040323
 FDT US 2004181084 A1 Div ex US 6746983
 PRAI US 2001-299213P 20010618; US 2002-165892 20020610;
 US 2004-806582 20040323
 IC ICM B01J023-00; B01J023-22; B01J023-64; B01J027-02; B01J027-057;
 C07C253-34
 ICS B01J023-16; B01J023-18; B01J023-20; B01J023-28; B01J023-68;
 B01J023-88; B01J023-887; B01J027-132; B01J037-04;
 B01J037-08; C07C027-16; C07C051-16; C07C051-215; C07C057-05;
 C07C253-24; C07C253-30; C07C255-07; C07C255-08
 ICA C07B061-00
 AB EP 1270068 A UPAB: 20031203
 NOVELTY - A catalyst comprising mixed metal oxide, is new.
 DETAILED DESCRIPTION - A catalyst (MoAvbMcXdOe), is new.
 M = tellurium, antimony or niobium;
 X = scandium, yttrium, lanthanum, rhenium, iridium, copper, silver,
 gold, zinc, gallium, silicon, germanium, arsenic, lead, sulfur, selenium,
 tin, bismuth, fluorine, chlorine, bromine or iodine
 when a = 1, b,c = 0.01-1, d = 0-1 and e = oxidation state of other
 elements, and when d = 0 and M = tellurium, b = 0.01-0.5 or c = 0.17-1.
 INDEPENDENT CLAIMS are also included for:
 (1) production of catalyst which involves admixing compounds of
 elements Mo, V, M and X and a solvent comprising water to form an
 admixture (I) containing at least 2 but less than all of the elements,
 heating the admixture at 80-150 deg. C for 5 minutes to 48 hours, then

admixing compounds of elements Mo, V, M and X with admixture (I) to form an admixture (II), heating the admixture (II) at 50-300 deg. C for 1 hour to several weeks in a closed vessel under pressure, and recovering insoluble material from the closed vessel;

(2) production of unsaturated carboxylic acid which involves subjecting alkane or mixture of alkane and alkene to vapor phase catalytic oxidation reaction in presence of the catalyst; and

(3) production of unsaturated nitrile which involves subjecting alkane or mixture of alkane and alkene, and ammonia to vapor phase catalytic oxidation reaction in presence of the catalyst.

USE - For production of unsaturated carboxylic acids and unsaturated nitriles (both claimed). The unsaturated nitriles such as acrylonitrile and methacrylonitrile are used as intermediates for preparation of fibers, synthetic resins and synthetic rubbers. The unsaturated carboxylic acids such as acrylic acid and methacrylic acid are used as starting materials for synthetic resins, coating materials and plasticizers.

ADVANTAGE - The catalyst exhibits good catalytic activities and the yield of unsaturated carboxylic acid is improved. The catalyst is operated more efficiently at lower temperature which significantly reduces the formation of acetic acid and carbon oxides, and increases selectivity to acrylic acid.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-D08; E10-A15B; E10-C04; E11-E; E31-F03; E31-G;
E31-L; E31-M; E31-P05; E34-E; E35; N01-D02; N02-D; N02-E03;
N02-E04; N03; N04-A; N06-E01; N07-C

TECH UPTX: 20031203

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Method: The preparation of catalyst further involves calcinating the recovered insoluble material.

ABEX UPTX: 20031203

EXAMPLE - Tellurium dioxide (1.59.g) and ammonium heptamolybdate tetrahydrate (20 ml) in water were added to a 45 ml Parr acid digestion bomb. The mixture was hydrothermally treated at 100 degrees C for 1 hour, and then vanadyl sulfate hydrate (10 ml) in water was added to the bomb at 60 degrees C with stirring. The bomb contents were hydrothermally treated at 175 degrees C for 60 hours. Black solids formed on the wall and bottom of the bomb were collected by gravity filtration, washed with deionized water (50 ml), dried in a vacuum oven at 25 degrees C overnight, and then calcined in air from 25-275 degrees C at 10 degreesC/minute and held at 275 degrees C for 1 hour, then in argon from 275-575 degrees C at 2 degreesC/minute and held at 575 degrees C for 2 hours. The final catalyst had a nominal composition of MoV0.5Te0.57Ox. The obtained catalyst was pressed in a mold and then broken and sieved to 10-20 mesh granules for reactor evaluation. The catalyst bed was positioned with glass wool in a reactor and heated with an electric furnace. A feed gas stream of propane, steam and air with a feed ratio of 1:3:96 was supplied to the reactor. The reaction was performed at 381 degrees C. The yield of acrylic acid was 31% and the conversion of propane was 50%.

L28 ANSWER 2 OF 7 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2003-169124 [17] WPIX

DNC C2003-044176

TI Preparation of improved catalyst for oxidizing, e.g., alkane, involves contacting mixed metal oxide with liquid contact component, recovering and calcining insoluble materials, and promoting the so-formed catalyst with promoters.

DC A41 E16 J04

IN GAFFNEY, A M; HEFFNER, M D; SONG, R

PA (ROHM) ROHM & HAAS CO; (GAFF-I) GAFFNEY A M; (HEFF-I) HEFFNER M D;

(SONG-I) SONG R

CYC. 33

PI EP 1254706 A2 20021106 (200317)* EN 18 B01J023-00
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
 RO SE SI TR

US 2002183198	A1 20021205 (200317)	C07C051-34
KR 2002082766	A 20021031 (200319)	B01J027-057
JP 2003038960	A 20030212 (200321)	17 B01J027-057
CN 1383916	A 20021211 (200324)	B01J027-057
BR 2002001364	A 20030610 (200341)	B01J037-04 <--
US 6645905	B2 20031111 (200382)	B01J023-00
US 2004029725	A1 20040212 (200412)	B01J027-14
MX 2002003871	A1 20030701 (200420)	B01J006-00
TW 575542	A 20040211 (200454)	C07C253-24

ADT EP 1254706 A2 EP 2002-252860 20020423; US 2002183198 A1 Provisional US
 2001-286278P 20010425, US 2002-117904 20020408; KR 2002082766 A KR
 2002-21919 20020422; JP 2003038960 A JP 2002-123833 20020425; CN 1383916 A
 CN 2002-118440 20020425; BR 2002001364 A BR 2002-1364 20020422; US 6645905
 B2 Provisional US 2001-286278P 20010425, US 2002-117904 20020408; US
 2004029725 A1 Provisional US 2001-286278P 20010425, Div ex US 2002-117904
 20020408, US 2003-636113 20030807; MX 2002003871 A1 MX 2002-3871 20020418;
 TW 575542 A TW 2002-107761 20020416

FDT US 2004029725 A1 Div ex US 6645905

PRAI US 2001-286278P 20010425; US 2002-117904 20020408;
 US 2003-636113 20030807

IC ICM B01J006-00; B01J023-00; B01J027-057; B01J027-14; **B01J037-04**
 ; C07C051-34; C07C253-24
 ICS B01J023-10; B01J023-20; **B01J023-28**; B01J023-887;
 B01J027-186; B01J027-187; B01J027-188; B01J027-19; B01J027-192;
 B01J027-198; B01J027-199; B01J027-57; **B01J037-00**;
B01J037-08; C01G039-00; C07C051-16; C07C051-215; C07C057-05;
 C07C253-00; C07C253-22; C07C255-08

ICA C07B061-00

AB EP 1254706 A UPAB: 20030312
 NOVELTY - Providing a method for improving the performance of mixed metal
 oxide catalysts.
 DETAILED DESCRIPTION - Preparation of an improved catalyst involves:
 (1) providing a mixed metal oxide of formula (AaVbNcXdOe);
 (2) contacting the mixed metal oxide with a liquid contact component,
 such as, organic acids, alcohols, inorganic acid or hydrogen peroxide to
 form a contact mixture;
 (3) recovering insoluble material from the contact mixture;
 (4) calcining the recovered insoluble material in a non-oxidizing
 atmosphere;
 (5) admixing the calcined recovered insoluble material with a
 promoter element(s) or its compound(s), or a solvent(s) from the promoter
 element or its compound to form an admixture;
 (6) removing the solvent(s) from the so-formed admixture to form a
 catalyst precursor; and
 (7) calcining the catalyst precursor.
 The promoter element can be gold, silver, rhenium, praseodymium,
 zinc, gallium, palladium, iridium, neodymium, yttrium, samarium, terbium,
 bromine, copper, scandium, chlorine, fluorine or iodine.
 A = Mo or W;
 N = Te, Sb or Se;
 X = Nb, Ta, Ti, Al, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce,
 As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm,
 Eu, Gd, Dy, Ho, Er, Tm, Yb, or Lu;
 a = 1;
 b = 0.01-2;

c = 0.01-1;
d = 0.01-1

The subcomponent (e) is dependent on the oxidation state of the other elements. The components A, V, N and X are present in such amounts than the atomic ratio of A:V:N:X is a:b:c:d.

An INDEPENDENT CLAIM is included for a process for producing an unsaturated carboxylic acid comprising subjecting an alkane, or a mixture of an alkane and an alkene, to a vapor phase catalytic oxidation reaction in the presence of the inventive catalyst.

USE - For preparing improved catalyst useful for oxidizing alkanes, or a mixture of alkanes and alkenes.

ADVANTAGE - The improved catalyst exhibits excellent catalytic activities by itself.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D08; E10-A15B; E10-C04G1A; E10-C04G1B; E10-C04H; E11-E;
E31-G; E31-K01; E31-L; E31-Q07; E35; E35-N; J04-E01;
J04-E04A; N01; N02; N03; N03-C01; N04; N06-E01; N07-C

ABEX UPTX: 20030312

EXAMPLE - A catalyst (6 g) was impregnated with 1.72 g samarium in 5% nitric acid and 5.2 g water followed by drying via rotavap at 50degrees C. and further vacuum dried at 25degrees C overnight. These dried materials were then calcined by placing the solid materials in an air atmosphere and then heating them to 275degrees C at 10degreesC/min and holding them under the air atmosphere at 275degrees C for 1 hour. The atmosphere was then changed to argon and the material was heated from 275degrees C to 600degrees C at 2degrees C/min and then material was held under the argon atmosphere at 600degrees C for 5 hours. The final catalyst had a nominal composition of Mo1V0.3Te0.23Nb0.125Sm0.0025Ox. The catalyst thus obtained was pressed in a mold and then broken and sieved to 10-20 mesh granules for reactor evaluation.

L28 ANSWER 3 OF 7 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2003-128650 [12] WPIX

CR 2004-688114 [67]

DNC C2003-032800

TI Catalyst component, used for preparation of unsaturated carboxylic acids and unsaturated nitriles, consists of orthorhombic phase of mixed metal oxide.

DC E17 J04

IN BOGAN, L E; BORS, D A; CAVALCANTI, F A P; CLARK, M B; GAFFNEY, A M; HAN, S (ROHM) ROHM & HAAS CO; (BOGA-I) BOGAN L E; (BORS-I) BORS D A; (CAVA-I)

CAVALCANTI F A P; (CLAR-I) CLARK M B; (GAFF-I) GAFFNEY A M; (HANS-I) HAN S

CYC 32

PI US 2002161256 A1 20021031 (200312)* 10 C07C253-34

EP 1254710 A2 20021106 (200313) EN B01J023-00

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
RO SE SI TR

JP 2003024787 A 20030128 (200318) 12 B01J027-057

KR 2002082763 A 20021031 (200319) B01J027-057

CN 1395996 A 20030212 (200335) B01J027-057

BR 2002001367 A 20030610 (200341) B01J027-057

MX 2002003869 A1 20030701 (200420) B01J029-00

US 6740620 B2 20040525 (200435) B01J023-00

ADT US 2002161256 A1 Provisional US 2001-286235P 20010425, US 2002-117859
20020408; EP 1254710 A2 EP 2002-252867 20020423; JP 2003024787 A JP
2002-123812 20020425; KR 2002082763 A KR 2002-21916 20020422; CN 1395996 A
CN 2002-118443 20020425; BR 2002001367 A BR 2002-1367 20020422; MX
2002003869 A1 MX 2002-3869 20020418; US 6740620 B2 Provisional US

2001-286235P 20010425, US 2002-117859 20020408
 PRAI US 2001-286235P 20010425; US 2002-117859 20020408
 IC ICM B01J023-00; B01J027-057; B01J029-00; C07C253-34
 ICS B01J023-16; B01J023-18; B01J023-20; **B01J023-28**; B01J023-32;
 B01J023-48; B01J023-58; B01J023-70; B01J023-887; **B01J037-04**
 ; **B01J037-08**; C01G039-00; C07C051-16; C07C051-215;
 C07C057-05; C07C253-22; C07C253-24; C07C255-08
 ICA C07B061-00
 AB US2002161256 A UPAB: 20041019
 NOVELTY - A catalyst component consists of the orthorhombic phase of a mixed metal oxide, which is active and selective for the preparation of unsaturated carboxylic acids and unsaturated nitriles.
 DETAILED DESCRIPTION - A catalyst component which consists of the orthorhombic phase of a mixed metal oxide of the formula $AaVbNcXdOe$ (I).
 A = Mo and/or W;
 N = Te and/or Se; and
 X = at least one element selected from Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb, Lu, Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I;
 a = 1;
 b = 0.01-1;
 c = 0.01-1;
 d = 0.01-1; and
 e = dependent on the oxidation state of the other elements.
 INDEPENDENT CLAIMS are included for:
 (1) the preparation of an orthorhombic phase mixed metal oxide catalyst, comprising:
 (a) admixing compounds of elements A, V, N and X and at least one solvent to form a solution, where N is at least one element selected from Te, Se and Sb;
 (b) admixing a seeding effective amount of an orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, with the solution to form a seeded solution;
 (c) removing solvent from the seeded solution to form a catalyst precursor; and
 (d) calcining the catalyst precursor to obtain the orthorhombic phase mixed metal oxide catalyst;
 (2) production of an unsaturated carboxylic acid by subjecting an alkane, or a mixture of an alkane and an alkene, to a vapor phase catalytic oxidation in the presence of the orthorhombic phase mixed metal oxide catalyst of formula (I) with N at least one element selected from Te, Se and Sb; and
 (3) production of an unsaturated nitrile which comprises subjecting an alkane, or a mixture of an alkane and an alkene, and ammonia to a vapor phase catalytic oxidation in the presence of the orthorhombic phase mixed metal oxide catalyst of formula (I) with N being Te and/or Se.
 USE - The catalyst component, consisting of the orthorhombic phase of a mixed metal oxide, is used in the preparation of unsaturated carboxylic acids and unsaturated nitriles by vapor phase catalytic oxidation of alkanes or a mixture of an alkane and an alkene
 ADVANTAGE - The orthorhombic phase of the mixed metal oxide can be prepared selectively, in a quantitative yield. This orthorhombic phase of a mixed metal oxide is active and selective for the preparation of unsaturated carboxylic acids and unsaturated nitriles.
 Dwg.0/0
 FS CPI
 FA AB; DCN
 MC CPI: E10-A15B; E10-C04H; E11-E; **E31-G**; J04-E04A; N01; N02; N03;
 N04-A; **N06-E01**; N07-C01

TECH

UPTX: 20030218

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Catalyst Preparation: N is at least one element selected from Te and Se.

The orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide, is prepared by:

- (i) providing a mixed metal oxide of formula (I),
- (ii) contacting the mixed metal oxide with a liquid contact member selected from organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture; and
- (iii) recovering insoluble material from the contact mixture to obtain the orthorhombic phase mixed metal oxide seed substantially free of hexagonal phase mixed metal oxide.

The liquid contact member is preferably an aqueous solution of oxalic acid.

The orthorhombic phase mixed metal oxide catalyst can also be prepared by:

- (a) admixing compounds of elements A, V, N and X and at least one solvent to form a first mixture;

- (b) removing solvent from the first mixture to form a first precursor;

- (c) calcining the first precursor to form a first calcined precursor;
- (d) contacting the first calcined precursor with a liquid contact member selected from the group consisting of organic acids, alcohols, inorganic acids and hydrogen peroxide to form a contact mixture; and

- (e) recovering insoluble material from the contact mixture to obtain the orthorhombic phase mixed metal oxide seed, substantially free of hexagonal phase mixed metal oxide.

ABEX

UPTX: 20030218

EXAMPLE - In a comparative example, Mo-V-Te-Nb mixed metal oxide (56.60 g) was added to a solution of 23.3 g oxalic acid dihydrate in 215 g water and stirred 6 hrs at 70-80 degreesC. It was cooled, filtered and dried to yield 45.28 g black solid. The X-ray diffraction pattern for this sample showed significant intensity at 2theta values of 28.3 degrees and 36.2 degrees, indicative of the hexagonal phase.

Ammonium heptamolybdate tetrahydrate (17.03 g), ammonium metavanadate (3.35 g) and telluric acid (5.09 g) were dissolved in 284 g water with heating. The resulting orange solution was cooled to 40 degreesC. Oxalic acid dihydrate (0.97 g) was dissolved in a 6.5 weight % solution of niobium oxalate in water (99.33 g). The niobium solution was added to the orange solution, and then 100 mg of the material as prepared in comparative example was added to the combined solutions. The mixture was dried, first on a rotary evaporator, and then overnight, under vacuum (6 mbar). The resulting precursor was sieved to remove more than 50 mesh fines, then calcined in a flowing atmosphere as follows: in an air atmosphere, the precursor was heated from room temperature to 275 degrees at a rate of 10 degreesC/min and then held at 275 degreesC for 1 hr; the atmosphere was switched to argon; in an argon atmosphere, the precursor was heated from 275-600 degreesC at a rate of 2 degreesC/min and then held at 600 degreesC for 2 hrs. The X-ray diffraction pattern for this sample showed very little intensity at 2theta values of 28.3 degrees and 36.2 degrees, indicative of a lack of the hexagonal phase.

L28 ANSWER 4 OF 7 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2003-077652 [08] WPIX

DNC C2003-020322

TI Preparation of catalyst, used to produce unsaturated carboxylic acids and nitriles, providing mixed metal oxide of specified formula, contacting with liquid, recovering insoluble material, and calcining.

DC A41 E19 J04

IN BOGAN, L E; GAFFNEY, A M; HAN, S; HEFFNER, M D; SONG, R

PA (ROHM) ROHM & HAAS CO; (BOGA-I) BOGAN L E; (GAFF-I) GAFFNEY A M; (HANS-I) HAN S; (HEFF-I) HEFFNER M D; (SONG-I) SONG R

CYC 33

PI EP 1254709 A2 20021106 (200308)* EN 15 B01J023-00
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
 RO SE SI TR

US 2002188149	A1 20021212 (200308)	C07C253-24
JP 2003024789	A 20030128 (200318)	14 B01J027-057
KR 2002082765	A 20021031 (200319)	B01J027-057
CN 1382522	A 20021204 (200322)	B01J023-16
BR 2002001368	A 20030610 (200341)	B01J037-04 <--
MX 2002003868	A1 20030701 (200420)	B01J023-00
TW 574186	A 20040201 (200453)	C07C253-24
US 2004181085	A1 20040916 (200461)	B01J023-00
US 6841699	B2 20050111 (200505)	B01J023-00

ADT EP 1254709 A2 EP 2002-252866 20020423; US 2002188149 A1 Provisional US 2001-286217P 20010425, US 2002-117908 20020408; JP 2003024789 A JP 2002-123817 20020425; KR 2002082765 A KR 2002-21918 20020422; CN 1382522 A CN 2002-118441 20020425; BR 2002001368 A BR 2002-1368 20020422; MX 2002003868 A1 MX 2002-3868 20020418; TW 574186 A TW 2002-107753 20020416; US 2004181085 A1 Provisional US 2001-286217P 20010425, Div ex US 2002-117908 20020408, US 2004-808861 20040324; US 6841699 B2 Provisional US 2001-286217P 20010425, US 2002-117908 20020408

PRAI US 2001-286217P 20010425; US 2002-117908 20020408;
 US 2004-808861 20040324

IC ICM B01J023-00; B01J023-16; B01J027-057; B01J037-04; C07C253-24
 ICS B01J021-08; B01J021-12; B01J021-14; B01J023-20; B01J023-28;
 B01J023-30; B01J023-34; B01J023-48; B01J023-76; B01J023-887;
 B01J023-888; B01J023-889; B01J023-89; B01J027-06; B01J027-132;
 B01J027-14; B01J027-186; B01J027-199; B01J037-06;
 B01J037-08; C01B019-00; C07C051-16; C07C051-215; C07C051-25;
 C07C057-05; C07C253-22; C07C253-26; C07C255-08

ICA C07B061-00

AB EP 1254709 A UPAB: 20031001

NOVELTY - Preparation of catalyst comprises:

- (a) Providing a mixed metal oxide of specified formula;C
- (b) Contacting the mixed metal oxide with a liquid contact member selected from organic acids, alcohols, inorganic acids and hydrogen;
- (c) Recovering insoluble material from the contact mixture; and
- (d) Calcining the recovered insoluble material in a non-oxidizing atmosphere to form the catalyst.

DETAILED DESCRIPTION - Preparation of catalyst comprises:

- (a) Providing a mixed metal oxide of formula (I);

$$\text{AaVbNcXdOe} \quad (\text{I})$$

A = Mo or W;
 N = Te or Se;
 $\text{X} = \text{Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, Ce, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb, Lu, Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F or I};$
 $a = 1;$
 $b = 0.1 - 2;$
 $c = 0.1 - 1;$
 $d = 0.01 - 1; \text{ and}$
 $e = \text{dependent on the oxidation state of the other elements.}$

(b) Contacting the mixed metal oxide with a liquid contact member selected from organic acids, alcohols, inorganic acids and hydrogen;

(c) Recovering insoluble material from the contact mixture; and

(d) Calcining the recovered insoluble material in a non-oxidizing atmosphere to form the catalyst.

INDEPENDENT CLAIMS are included for:

- (1) The catalyst produced by the process;

(2) Production of an unsaturated carboxylic acid comprising subjecting an alkane and/or alkene, to vapor phase catalytic oxidation reaction in the presence of the catalyst; and

(3) Production of an unsaturated nitrile which comprises subjecting an alkane and/or alkene and ammonia to vapor phase catalytic oxidation reaction in the presence of the catalyst.

USE - Used in vapor phase catalytic oxidation, to produce unsaturated carboxylic acids, such as (meth)acrylic acid, and unsaturated nitriles, such as (meth)acrylonitrile.

ADVANTAGE - The catalyst has improved oxidation/ammonoxidation performance.

Dwg. 0/0

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-D08; E10-A15B; E10-C02D1; E10-C02D2; E10-C04G1; E10-C04H; E10-C04J1U; E10-C04J2U; E10-C04L; E10-E04L; E31-E; E31-G; E31-H05; E31-K01; E31-L; E31-Q08; E35; J04-E03; J04-E04A; J04-E05; N01-C03; N01-D01; N02; N03; N04-B; N04-D; N07-C01; N07-D08B

TECH UPTX: 20031001

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Materials: The mixed metal oxide of step (a) is an orthorhombic phase mixed metal oxide, and the liquid contact member is an aqueous solution of oxalic acid, telluric acid, or nitric acid. The calcined recovered solid material is

L28 ANSWER 5 OF 7 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2003-077651 [08] WPIX

DNC C2003-020321

TI Preparation of catalyst, used to produce unsaturated carboxylic acids and nitriles, admixing compounds of elements Mo, V, N, X and Z and solvent(s), removing solvent(s), and calcining.

DC A41 E16 J04

IN BOGAN, L E; PAK, A; PARK, A

PA (ROHM) ROHM & HAAS CO; (BOGA-I) BOGAN L E; (PAKA-I) PAK A

CYC 33

PI EP 1254708 A2 20021106 (200308)* EN 12 B01J023-00
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
RO SE SI TR

US 2002183548	A1	20021205 (200308)	C07C051-21
JP 2003024790	A	20030128 (200318)	11 B01J027-057
KR 2002084419	A	20021107 (200320)	B01J023-887
CN 1390641	A	20030115 (200330)	B01J027-057
BR 2002001439	A	20030610 (200341)	B01J037-04
US 6645906	B2	20031111 (200382)	B01J023-00
US 2004019233	A1	20040129 (200413)	C07C253-24
MX 2002003873	A1	20030701 (200420)	B01F015-06
TW 592802	A	20040621 (200506)	B01J023-00

ADT EP 1254708 A2 EP 2002-252863 20020423; US 2002183548 A1 Provisional US 2001-287506P 20010430, US 2002-117944 20020408; JP 2003024790 A JP 2002-128072 20020430; KR 2002084419 A KR 2002-23800 20020430; CN 1390641 A CN 2002-118861 20020429; BR 2002001439 A BR 2002-1439 20020426; US 6645906 B2 Provisional US 2001-287506P 20010430, US 2002-117944 20020408; US 2004019233 A1 Provisional US 2001-287506P 20010430, Div ex US 2002-117944 20020408, US 2003-622967 20030718; MX 2002003873 A1 MX 2002-3873 20020418; TW 592802 A TW 2002-108111 20020419

FDT US 2004019233 A1 Div ex US 6645906

PRAI US 2001-287506P 20010430; US 2002-117944 20020408;
US 2003-622967 20030718

IC ICM B01F015-06; B01J023-00; B01J023-887; B01J027-057; B01J037-04
; C07C051-21; C07C253-24

ICS B01J023-16; B01J023-20; B01J023-28; B01J023-88;
 B01J037-08; C01B019-00; C07C051-16; C07C051-215; C07C057-05;
 C07C253-00; C07C253-22; C07C255-07; C07C255-08

ICA C07B061-00

AB EP 1254708 A UPAB: 20030204

NOVELTY - Production of catalyst of specified formula comprises:

(a) Admixing compounds of elements Mo, V, N, X and Z and solvent(s) at at least 45 deg. C;

(b) Removing the solvent(s) from the admixture to form a catalyst precursor; and

(c) Calcining the catalyst precursor to obtain the mixed metal oxide.

DETAILED DESCRIPTION - Production of catalyst comprising a mixed metal oxide of formula (I):

Mo_aV_bN_cX_dZ_eO_f (I)

N = Te or Sb;

X = Nb, Ta, Ti, W, Se, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb or Lu;

Z = Au, Ag, Re, Pr, Zn, Ga, Pd, Ir, Nd, Y, Sm, Tb, Br, Cu, Sc, Cl, F and I;

a = 1;

b = 0.01 - 1.0;

c = 0.01 - 1.0;

d = 0.01 - 1.0;

e = 0 - 0.1; and

f = dependent on the oxidation state of the other elements.

comprises:

(a) Admixing compounds of elements Mo, V, N, X and Z and solvent(s) at at least 45 deg. C;

(b) Removing the solvent(s) from the admixture to form a catalyst precursor; and

(c) Calcining the catalyst precursor to obtain the mixed metal oxide.

INDEPENDENT CLAIMS are included for:

(1) The catalyst produced by the process;

(2) Production of an unsaturated carboxylic acid comprising subjecting an alkane and/or alkene, to vapor phase catalytic oxidation reaction in the presence of the catalyst;

(3) Production of an unsaturated nitrile which comprises subjecting an alkane and/or alkene and ammonia to vapor phase catalytic oxidation reaction in the presence of the catalyst.

USE - Used in vapor phase catalytic oxidation, to produce unsaturated carboxylic acids, such as (meth)acrylic acid, and unsaturated nitriles, such as (meth)acrylonitrile.

ADVANTAGE - The catalyst has improved oxidation/ammonoxidation performance.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-D10; E10-A15B; E10-C04G1; E10-C04H; E11-E; E31-G ; E31-K01; E31-L; E31-Q07; E35; E35-N; J04-E01; J04-E04A; N01; N02; N03; N03-C; N06-E01; N07-C

TECH UPTX: 20030204

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Process: The catalyst precursor is calcined in two stages, first calcination under an oxidizing atmosphere, and second calcination under a non-oxidizing atmosphere.

L28 ANSWER 6 OF 7 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2002-407479 [44] WPIX

DNC C2002-114530

TI Catalyst, used in vapor phase catalytic oxidation to produce unsaturated

nitriles and unsaturated carboxylic acids, comprising a promoted mixed metal oxide having specified formula is new.

DC A41 E16 E17 J04
 IN CHATURVEDI, S; GAFFNEY, A M; HAN, S; HEFFNER, M D; SONG, R
 PA (ROHM) ROHM & HAAS CO; (CHAT-I) CHATURVEDI S; (GAFF-I) GAFFNEY A M;
 (HANS-I) HAN S; (HEFF-I) HEFFNER M D; (SONG-I) SONG R
 CYC 33
 PI EP 1192986 A1 20020403 (200244)* EN 15 B01J023-00
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
 RO SE SI TR
 US 2002062038 A1 20020523 (200244) B01J023-10
 BR 2001004337 A 20020611 (200248) B01J023-16
 CN 1346701 A 20020501 (200252) B01J023-24
 JP 2002159858 A 20020604 (200252) 15 B01J027-057
 KR 2002030011 A 20020422 (200269) B01J023-63
 MX 2001009743 A1 20020501 (200368) B01J023-00
 US 2003204111 A1 20031030 (200372) C07C051-16
 US 6734136 B2 20040511 (200431) B01J027-057
 US 6790988 B2 20040914 (200460) C07C051-16
 TW 592801 A 20040621 (200506) B01J023-00
 ADT EP 1192986 A1 EP 2001-308128 20010925; US 2002062038 A1 Provisional US
 2000-235980P 20000928, Provisional US 2000-235981P 20000928, Provisional
 US 2000-236143P 20000929, US 2001-927288 20010810; BR 2001004337 A BR
 2001-4337 20010927; CN 1346701 A CN 2001-140943 20010927; JP 2002159858 A
 JP 2001-299122 20010928; KR 2002030011 A KR 2001-58664 20010921; MX
 2001009743 A1 MX 2001-9743 20010927; US 2003204111 A1 Provisional US
 2000-235980P 20000928, Provisional US 2000-235981P 20000928, Provisional
 US 2000-236143P 20000929, Div ex US 2001-927288 20010810, US 2003-430599
 20030507; US 6734136 B2 Provisional US 2000-235980P 20000928, Provisional
 US 2000-235981P 20000928, Provisional US 2000-236143P 20000929, US
 2001-927288 20010810; US 6790988 B2 Provisional US 2000-235980P 20000928,
 Provisional US 2000-235981P 20000928, Provisional US 2000-236143P
 20000929, Div ex US 2001-927288 20010810, US 2003-430599 20030507; TW
 592801 A TW 2001-123902 20010927
 PRAI US 2001-927288 20010810; US 2000-235980P 20000928;
 US 2000-235981P 20000928; US 2000-236143P 20000929;
 US 2003-430599 20030507
 IC ICM B01J023-00; B01J023-10; B01J023-16; B01J023-24; B01J023-63;
 B01J027-057; C07C051-16
 ICS B01J023-28; B01J023-46; B01J023-64; B01J023-76;
 B01J037-04; B01J037-08; C01B019-00; C01G015-00;
 C07C051-00; C07C051-215; C07C051-225; C07C057-05; C07C253-00;
 C07C253-24; C07C253-26; C07C255-08
 ICA C07B061-00
 AB EP 1192986 A UPAB: 20020711
 NOVELTY - Catalyst comprising a promoted mixed metal oxide having
 specified formula is new.
 DETAILED DESCRIPTION - Catalyst comprising a promoted mixed metal
 oxide of formula (I) is new.
 AaMbNcXdIrSmfOg (I)
 A = Mo or W;
 M = V or Ce;
 N = Te, Sb or Se;
 X = Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Sb, Bi, B,
 In, As, Ge, Sn, Li, Na, or K;
 a = 1;
 b, c, and d = 0.01 - 1.0;
 e and f = 0 or 0.001 - 0.1; and
 g = dependent on the oxidation state of the other elements.
 With the proviso that e and f cannot simultaneously be 0.

INDEPENDENT CLAIMS are included for (i) the production of unsaturated carboxylic acids, comprising vapor phase catalytic oxidation of an alkane or alkane/alkene mixture, in the presence of the catalyst; and (ii) the production of unsaturated nitriles, comprising vapor phase catalytic oxidation of an alkane or alkane/alkene mixture and ammonia, in the presence of the catalyst.

USE - Used to produce unsaturated nitriles, such as acrylonitrile and methacrylonitrile, which are important intermediates for the preparation of fibers, synthetic resins, synthetic rubber etc. The catalyst is also used to produce unsaturated carboxylic acids, such as acrylic acid and methacrylic acid, which are important intermediates for the preparation of synthetic resins, coating materials, and plasticizers.

ADVANTAGE - The catalysts have enhanced activity and selectivity, leading to a improvement in the yield of the desired reaction product.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-D08; E10-A15B; E10-C04G; E10-C04H; **E31-G**; E31-L; **E31-M**; E31-Q08; E35; J04-E01; J04-E04; N01; N02; N03; N04-A; N07-C

TECH UPTX: 20020711

TECHNOLOGY FOCUS - POLYMERS - Preferred Process: The catalyst is prepared by admixing compounds of the elements and at least one solvent; removing the solvent from the admixture to obtain a catalyst precursor; and calcinating the catalyst precursor.

ABEX UPTX: 20020711

DEFINITIONS - Preferred Definitions:

A = Mo;

N = Te;

M = V;

N = Te and/or Sb;

X = Nb;

e = 0; and

f = 0.

L28 ANSWER 7 OF 7 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2002-407477 [44] WPIX

DNC C2002-114528

TI Catalyst, used in vapor phase catalytic oxidation to produce unsaturated nitriles and unsaturated carboxylic acids, comprising a promoted mixed metal oxide having specified formula is new.

DC A41 E16 E17 J04

IN CHATURVEDI, S; GAFFNEY, A M; HAN, S; LE, D H N; NHU LE, D H
PA (ROHM) ROHM & HAAS CO; (CHAT-I) CHATURVEDI S; (GAFF-I) GAFFNEY A M;
(HANS-I) HAN S; (LEDH-I) LE D H N; (LEDH-I) NHU LE D H

CYC 32

PI EP 1192982 A1 20020403 (200244)* EN 19 B01J023-00

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
RO SE SI TR

BR 2001004321 A 20020604 (200246) B01J023-16

US 2002072629 A1 20020613 (200246) C07C051-16

JP 2002159857 A 20020604 (200252) 19 B01J027-057

CN 1347755 A 20020508 (200253) B01J023-24

KR 2002025714 A 20020404 (200266) B01J023-64

US 6589907 B2 20030708 (200353) B01J023-00

US 2003191336 A1 20031009 (200367) C07C253-26

US 6700015 B2 20040302 (200417) C07C027-10

TW 592808 A 20040621 (200506) B01J023-64

ADT EP 1192982 A1 EP 2001-308114 20010925; BR 2001004321 A BR 2001-4321

20010927; US 2002072629 A1 Provisional US 2000-235978P 20000928,

Provisional US 2000-236129P 20000928, Provisional US 2000-236260P 20000928, US 2001-928019 20010810; JP 2002159857 A JP 2001-297738 20010927; CN 1347755 A CN 2001-140931 20010927; KR 2002025714 A KR 2001-58680 20010921; US 6589907 B2 Provisional US 2000-235978P 20000928, Provisional US 2000-236129P 20000928, Provisional US 2000-236260P 20000928, US 2001-928019 20010810; US 2003191336 A1 Provisional US 2000-235978P 20000928, Provisional US 2000-236129P 20000928, Provisional US 2000-236260P 20000928, Div ex US 2001-928019 20010810, US 2003-430194 20030506; US 6700015 B2 Provisional US 2000-235978P 20000928, Provisional US 2000-236129P 20000928, Provisional US 2000-236260P 20000928, Div ex US 2001-928019 20010810, US 2003-430194 20030506; TW 592808 A TW 2001-123930 20010927

FDT US 2003191336 A1 Div ex US 6589907; US 6700015 B2 Div ex US 6589907

PRAI US 2001-928019 20010810; US 2000-235978P 20000928; US 2000-236129P 20000928; US 2000-236260P 20000928; US 2003-430194 20030506

IC ICM B01J023-00; B01J023-16; B01J023-24; B01J023-64; B01J027-057; C07C027-10; C07C051-16; C07C253-26

ICS B01J021-08; B01J023-06; B01J023-08; B01J023-28; B01J023-54; B01J023-76; B01J037-04; B01J037-08; C01B019-00; C01G015-00; C07C051-00; C07C051-21; C07C051-215; C07C057-05; C07C253-00; C07C253-18; C07C253-24; C07C255-08

ICA C07B061-00

AB EP 1192982 A UPAB: 20020711

NOVELTY - Catalyst comprising a promoted mixed metal oxide having specified formula is new.

DETAILED DESCRIPTION - Catalyst comprising a promoted mixed metal oxide of formula (I) is new.

AaMbNcXdZneGafOf (I)

A = Mo or W;

M = V or Ce;

N = Te, Sb or Se;

X = Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Sb, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb or Lu;

a = 1;

b, c, and d = 0.01 - 1.0;

e and f = 0 or 0.001 - 0.1; and

g = dependent on the oxidation state of the other elements.

With the proviso that e and f cannot simultaneously be 0.

INDEPENDENT CLAIMS are included for (i) the production of unsaturated carboxylic acids, comprising vapor phase catalytic oxidation of an alkane or alkane/alkene mixture, in the presence of the catalyst; and (ii) the production of unsaturated nitriles, comprising vapor phase catalytic oxidation of an alkane or alkane/alkene mixture and ammonia, in the presence of the catalyst.

USE - Used in vapor phase catalytic oxidation to produce unsaturated nitriles, such as acrylonitrile and methacrylonitrile, which are important intermediates for the preparation of fibers, synthetic resins, synthetic rubber etc. The catalyst is also used to produce unsaturated carboxylic acids, such as acrylic acid and methacrylic acid, which are important intermediates for the preparation of synthetic resins, coating materials, and plasticizers.

ADVANTAGE - The catalysts have enhanced activity and selectivity, leading to an improvement in the yield of the desired reaction product.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-D08; E10-A15B; E10-C04H; E31-G; E31-K01; E31-L; E31-M; E31-Q08; E35; J04-E04A; N01; N02; N03; N04-A;

N04-B; N07-C

TECH UPTX: 20020711

TECHNOLOGY FOCUS - POLYMERS - Preferred Process: The catalyst is prepared by admixing compounds of the elements and at least one solvent; removing the solvent from the admixture to obtain a catalyst precursor; and calcinating the catalyst precursor.

ABEX UPTX: 20020711

DEFINITIONS - Preferred Definitions:

A = Mo;
 N = Te;
 M = V;
 N = Te and/or Sb;
 X = Nb;
 e = O; and
 f = O.

=> => d all abeq tech abex 126

L26 ANSWER 1 OF 1 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2004-363753 [34] WPIX
 DNC C2004-137252
 TI Catalyst for the production of unsaturated carboxylic acid or unsaturated nitrile by vapor phase oxidation, contains mixed metal oxide of tellurium or antimony.
 DC A41 E19 F01 J04
 IN GAFFNEY, A M; SONG, R
 PA (ROHM) ROHM & HAAS CO; (GAFF-I) GAFFNEY A M; (SONG-I) SONG R
 CYC 36
 PI US 2004063990 A1 20040401 (200434)* 21 B01J027-128
 EP 1407819 A2 20040414 (200434) EN B01J023-28 <--
 R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV
 MC MK NL PT RO SE SI SK TR
 JP 2004148302 A 20040527 (200441) 32 B01J027-057
 CN 1491745 A 20040428 (200446) B01J027-057
 KR 2004030364 A 20040409 (200453) B01J027-02
 BR 2003004188 A 20040831 (200460) B01J027-057
 ADT US 2004063990 A1 Provisional US 2002-415288P 20021001, US 2003-676884
 20030930; EP 1407819 A2 EP 2003-255811 20030917; JP 2004148302 A JP
 2003-340313 20030930; CN 1491745 A CN 2003-159449 20030925; KR 2004030364
 A KR 2003-68337 20031001; BR 2003004188 A BR 2003-4188 20030922
 PRAI US 2002-415288P 20021001; US 2003-676884 20030930
 IC ICM B01J023-28; B01J027-02; B01J027-057; B01J027-128
 ICS B01J023-34; B01J023-652; B01J023-887; B01J027-06; B01J027-125;
 B01J027-13; B01J027-132; B01J027-135; B01J027-14; B01J027-186;
 B01J027-187; B01J027-188; B01J027-19; B01J027-192; B01J027-198;
 B01J027-199; B01J035-00; B01J037-00; B01J037-04;
 B01J037-08; B01J037-10; C07C051-215; C07C057-04;
 C07C057-05; C07C067-05; C07C253-18; C07C253-24
 AB US2004063990 A UPAB: 20040527
 NOVELTY - A catalyst contains a mixed metal oxide (I) of tellurium or antimony.
 DETAILED DESCRIPTION - A catalyst comprises a mixed metal oxide of formula (I).
 MOaVbMcNbdxOf (I)
 M = Te or Sb;
 X = Li, Na, K, Rb, Cs, Mg, Ca, Sr, Ba, Sc, Y, La, Ti, Zr, Hf, Ta,
 Cr, W, Mn, Re, Fe, Ru, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, B, Ga, In,
 Pb, P, As, Sb, Bi, Se, F, Cl, Br, I, Pr, Nd, Sm or Tb.
 When M is Sb, X cannot be Sb. a, b, c, d, e and f are the relative

atomic amounts of the elements Mo, V, M, Nb, X or O respectively; and when $a = 1$, $b = 0.01-1$, $c = 0.01-1$, $d = 0.01-1$, e is greater than 0 but at most 1 and f is dependent on the oxidation state of the other elements.

An INDEPENDENT CLAIM is also included for a process for producing a catalyst comprising a mixed metal oxide, comprising mixing compounds of molybdenum (Mo), vanadium (V), M, niobium (Nb), or X, as needed, and a solvent comprising water to form a first mixture containing at least 2 but less than all of the elements Mo, V, M, Nb and X. The first mixture is heated at 25-200 deg. C for 5 minutes to 48 hours. Compounds of Mo, V, M, Nb and X, as needed, are mixed with the first mixture to form a second mixture containing elements Mo, V, M, Nb and X, in the respective relative atomic proportions a , b , c , d and e , such that when $a = 1$, $b = 0.01-1$, $c = 0.01-1$, $d = 0.01-1$ and e is greater than 0 but at most 1. The second mixture is heated at 50-300 deg. C for 1 hour to several weeks, in a closed vessel under pressure. An insoluble material is recovered from the closed vessel to obtain a catalyst.

USE - The catalyst is used for the production of an unsaturated carboxylic acid by the vapor phase oxidation of an alkane or a mixture of an alkane and an alkene; or the production of an unsaturated nitrile by the vapor phase oxidation of an alkane, or a mixture of an alkane and an alkene, and ammonia (claimed). (Meth)acrylonitrile is used in the production of fibers, resins and rubbers.

ADVANTAGE - The catalyst exhibits good catalytic activities.

Dwg.0/4

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-D08; E10-A15B; E10-C04G1; E10-C04H; E11-E; E11-F07;
E31-G; E31-K05B; E31-M; E31-Q07; E35; F01-D02;
J04-E04A; N01; N02; N03; N06-E01; N07-C; N07-D08

TECH UPTX: 20040527

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Method: The recovered insoluble material is calcined.

ABEX UPTX: 20040527

EXAMPLE - To a 125 ml Parr Acid Digestion Bomb with an inner tube made of polytetrafluoroethylene, 3.15 g tellurium dioxide and 60 ml of 0.143 M ammonium heptamolybdate tetrahydrate in water were added. The mixture was first hydrothermally treated at 100degreesC for 1.5 hours, and then 6 ml of 0.1 M palladium nitrate hydrate in water and 6.5 g vanadyl sulfate hydrate were added to the bomb at 60degreesC followed by 30 ml aqueous solution (0.2 M in Nb) of ammonium niobium oxalate with stirring. The bomb contents were hydrothermally treated at 175degreesC for 4 days. Black solids formed in the bomb were collected by gravity filtration, washed with deionized water (50 ml), dried in a vacuum oven at 25degreesC overnight, and then calcined in air from 25-275degreesC at 10degreesC/minutes and held at 275degreesC for 1 hour, then in argon from 275-600degreesC at 2degreesC/minutes and held at 600degreesC for 2 hours. The final catalyst had a nominal composition of Pd0.01Mo1V0.43Te0.33Nb0.10x. It was pressed and sieved to 14-20 mesh granules for reactor evaluation.

=> d all abeq tech abex tot l29

L29 ANSWER 1 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2004-272549 [26] WPIX

DNC C2004-105881

TI Manufacture of oxide catalyst for gaseous phase oxidation or ammoxidation of propane or isobutane, involves preparing raw material liquid at preset non-stirring time.

DC A41 E19 J04

PA (ASAHI) ASAHI KASEI KK
 CYC 1
 PI JP 2003210982 A 20030729 (200426)* 7 B01J023-28 <--
 ADT JP 2003210982 A JP 2002-13251 20020122
 PRAI JP 2002-13251 20020122
 IC ICM B01J023-28
 ICS B01J037-04; C07C051-215; C07C057-05; C07C253-24; C07C255-08
 ICA C07B061-00
 AB JP2003210982 A UPAB: 20040421
 NOVELTY - A raw material is prepared, dried and baked to obtain an oxide catalyst. Non-stirring time with respect to the raw material liquid obtained in raw material preparation process is set to less than 1 hour.
 DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:
 (1) an oxide catalyst; and
 (2) the manufacture of unsaturated acid or unsaturated nitrile which involves subjecting propane or isobutane to oxidation or ammoxidation in the gaseous phase, using the oxide catalyst.
 USE - The oxide catalyst is used for gaseous phase catalytic oxidation or catalytic ammoxidation of propane or isobutane to obtain unsaturated acid or unsaturated nitrile (claimed).
 ADVANTAGE - An oxide catalyst with small reduction in property is manufactured with favorable reproducibility and in large quantities.
 Dwg. 0/0
 FS CPI
 FA AB; DCN
 MC CPI: A01-D00D; E10-A15B; E10-C04G1; E11-E; E11-F07; E31-G;
 E31-M; E35-N; E35-Q; J04-E04; N03-C01; N03-C03;
 N03-D02; N03-H; N04-A; N06-E01; N07-C01; N07-D08
 TECH UPTX: 20040421
 TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Condition: Non-stirring time with respect to raw material liquid obtained in raw material preparation is set to less than 20 minutes.
 Preferred Catalyst: The oxide catalyst is of formula (I):
 $M_{a}O_{b}Nb_{c}X_{n}$ (I)
 X = tellurium and/or antimony, preferably antimony;
 a, b, c = 0.01-1; and
 n = number decided by the valency of the structure metal.
 The catalyst is prepared from a raw material liquid contains niobium. The niobium-containing raw material contains dicarboxylic acid and a niobium compound in a molar ratio of 1-4. The catalyst is supported on silica. The amount of silica in the catalyst is 20-60 wt.%.
 ABEX UPTX: 20040421
 EXAMPLE - Ammonium heptamolybdate (in g) (448.3), ammonium metavanadate (65.36) and antimony trioxide (77.72) were added to water (2353) and nitrogen gas was circulated. Compounds were stirred and heated at 90 degreesC to obtain a liquid mixture (I). 30 weight% hydrogen peroxide solution of hydrogen peroxide (92.12), and antimony trioxide (22.21) were added to niobium containing liquid (398) and stirred and mixed at room temperature for 1 hour to obtain a liquid mixture (II). The liquid mixture (I) was cooled to 70 degreesC, and silica sol (30.6 weight%) containing silica (1471) was added. 30 weight% hydrogen peroxide solution containing hydrogen peroxide (90.68) was added and stirred at 47 degreesC for 1 hour. The liquid mixture (II) was added and stirring was continued for 20 minutes to obtain a raw material liquid. The raw material liquid was dried to obtain dry microsphere like powder. The dry powder was baked to obtain an oxide catalyst. The catalyst (45) was filled in a reaction tube and mixed gas of propane, ammonia, oxygen and helium in a molar ratio of 1:0.6:1.5:5.6 was supplied. Propane was subjected to ammoxidation at 440 degreesC and normal pressure to obtain acrylonitrile. Propane conversion

ratio was 50.5 mol% and acrylonitrile selectivity was 66.5 mol%.

L29 ANSWER 2 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2004-228451 [22] WPIX
 DNC C2004-089880
 TI Production of lactones by catalytic carbonylation of oxiranes comprises use of a catalyst system comprising a carbonylation catalyst of a neutral or anionic complex of a Group 5-11 transition metal element and a Lewis acid.
 DC A41 E13 J04
 IN ALLMENDINGER, M; LUINSTRA, G; RIEGER, B
 PA (BADI) BASF AG
 CYC 28
 PI DE 10235316 A1 20040212 (200422)* 8 C07D303-02
 WO 2004012861 A1 20040212 (200422) GE B01J031-22
 RW: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO
 SE SI SK TR
 W: JP US
 ADT DE 10235316 A1 DE 2002-10235316 20020801; WO 2004012861 A1 WO 2003-EP8478
 20030731
 PRAI DE 2002-10235316 20020801
 IC ICM B01J031-22; C07D303-02
 ICS B01J031-12; B01J037-04; C07D305-12; C07F015-06
 AB DE 10235316 A UPAB: 20040331
 NOVELTY - A process for the production of lactones by catalytic carbonylation of oxiranes comprises use of a catalyst system comprising at least one carbonylation catalyst of a neutral or anionic complex of a Group 5-11 transition metal element and at least one Lewis acid with the exception of ((salph)Al(THF₂))(Co(CO)₄).
 DETAILED DESCRIPTION - A process for the production of lactones by catalytic carbonylation of oxiranes comprises use of a catalyst system (I) comprising (A) at least one carbonylation catalyst of a neutral or anionic complex of a Group 5-11 transition metal element and (B) at least one Lewis acid with the exception of ((salph)Al(THF₂))(Co(CO)₄).
 INDEPENDENT CLAIMS are included for:
 (1) the catalyst system (I) and;
 (2) a process for the preparation of the catalyst system (I) by mixing components (A) and (B).
 USE - The catalyst (I) is useful for carbonylation reactions (claimed).
 ADVANTAGE - The process is cost effective and efficient and results in an optically enriched beta-lactone product.
 Dwg.0/0
 FS CPI
 FA AB; DCN
 MC CPI: A01-E12; E05-A; E05-B; E05-D; E05-F; E05-G; E05-H; E05-J;
 E05-L; E05-L02B; E05-L03A; E05-M; E05-N; E07-A02C;
 E07-A02G; E07-A03C; E07-H; E31-N05B; J04-E04; N01; N02; N03; N04-A;
 N05-B; N05-C
 TECH UPTX: 20040331
 TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Process: The lactone is a mixture of S- and R-enantiomers with one being in excess. Component (A) has neutral ligands and is of formula (1). (Man⁺)_m(Mb(L)₄)₂ (1)
 Mb = Group 8-10 transition metal with a formal charge of -1;
 L = PR₃, P(OR)₃, NR₃, SR₂, OR₂, CO, RCN, RNO₂, (RO)(R₁O)C=O, 9R(R₁)C=O or (R)C=O(OR₁);
 Ma = Group 1 or 2 element, Zn, Hg bis(triarylphosphine)iminium, trityl or T(R)₄;
 T = N, P or As;
 R, R₁ = H, alkyl, aryl, alkanyl or aralkyl;

m, n = 1 or 2;

l = n x m

Component (A) contains cobalt. The chiral Lewis acid (B) is a Group 2-13 element which is coordinatively unsaturated.

ABEX

UPTX: 20040331

EXAMPLE - A chromium-salen complex (124.2 mg, (1R, 2R)-(-)-(1,2-cyclohexandiamino-N,N'-bis(3,5-di-t-butylsalicylidene)chromium (III)) was added to a mixture of Na(CoCO₄) (0.39 mmol) in rac-propylene oxide under ice cooling and in an argon atmosphere prior to addition to an autoclave (100 ml) and pressurizing to 60-65 bar CO. The autoclave was depressurized and cooled. The yield of beta-butyrolactone was around 25% with an enantiomeric excess of the S-isomer of about 8%. In comparison use of an aluminum salen complex resulted in a 11% yield of beta-butyrolactone with no enantiomeric excess.

L29 ANSWER 3 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2004-147100 [15] WPIX

DNC C2004-059223

TI Manufacture of oxide catalyst used for oxidation of propane, involves specifying residence time of raw material liquid in longest pipe in which liquid circulates during preparation and/or drying process, to preset value.

DC A41 E19 H04 J04

PA (ASAHI) ASAHI KASEI KK

CYC 1

PI JP 2003181287 A 20030702 (200415)* 7 B01J023-28 <--

ADT JP 2003181287 A JP 2001-379626 20011213

PRAI JP 2001-379626 20011213

IC ICM B01J023-28

ICS B01J037-00; B01J037-04; C07B061-00; C07C051-215;
C07C051-25; C07C253-24; C07C253-26

AB JP2003181287 A UPAB: 20040302

NOVELTY - A raw material liquid is prepared, dried and baked to form oxide catalyst. The residence time of raw material liquid in the longest pipe in which raw material liquid circulates during preparation process and/or drying process, is 3 seconds to 1 hour.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) oxide catalyst; and

(2) manufacture of unsaturated acid or unsaturated nitrile involves performing gas phase catalytic oxidation or gas phase contact ammoxidation of propane or isobutylene in the presence of the oxide catalyst.

USE - For manufacturing oxide catalyst used for gas-phase catalytic oxidation or gas-phase contact ammoxidation of propane, isobutylene or propylene for manufacturing unsaturated acid or unsaturated nitrile (all claimed).

ADVANTAGE - The gelatinization of raw material liquid during manufacture of oxide catalyst is suppressed. Manufacture of oxide catalyst with high productivity is enabled. The oxide catalyst has high selectivity with respect to unsaturated acid or unsaturated nitrile.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-D08; E10-A15B; E10-C04G1; E10-C04H; E11-E; E31-G
; E31-M; H04-E; H04-F01; H04-F02E; J04-E01; J04-E04A;
N03-C03; N03-D02; N03-H; N04-A; N06-E01; N07-C

TECH UPTX: 20040302

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Process: The residence time in the longest piping is 3 seconds to 20 minutes. The drying process is a spray-drying method. Preferred Catalyst: The raw material liquid

contains niobium, and is obtained from dicarboxylic acid and niobium compound. The molar ratio of dicarboxylic acid and niobium in the catalyst is 1-4. The oxide catalyst is of formula, $Mo_1VaNb_bX_cOn$, where X is tellurium and/or antimony, preferably antimony, a, b and c are 0.01-1, and n is valency of metal. The oxide catalyst is supported by silica. The content of silica is 20-60 wt.% with respect to total weight of catalyst and silica.

ABEX UPTX: 20040302

EXAMPLE - Niobic acid (in g) (795.1) and oxalic acid dihydrate (3120) were mixed with water (5640). The liquid mixture was heated at 95degreesC for 1 hour and the aqueous solution was separated by filtration. The obtained niobium-containing liquid had oxalic acid to niobium molar ratio of 2.395. Water (2323), ammonium heptamolybdate (442.7), ammonium metavanadate (64.53) and antimony trioxide (80.39) were mixed in a container under nitrogen gas atmosphere. The mixture was heated at 90degreesC for 2 hours to form a liquid mixture (A). Hydrogen peroxide solution (96.63) containing 30 weight% hydrogen peroxide was added to obtained niobium-containing liquid (431.6). Further, antimony trioxide (21.92) was added and stirred at room temperature to form liquid mixture (B). The solution (A) was cooled to 70degreesC. Silica sol (1471) containing silica (30.6 weight%) was added. Further, hydrogen peroxide solution (125.1) was added and stirred at 45degreesC for 1 hour. Then, liquid mixture (B) was added to form a raw material liquid. The residence time of the raw material liquid in the longest pipe was 2 minutes and 45 seconds. The solution was supplied to centrifugation type spray-drier. The solution was dried to obtain powder which was baked in a stainless steel pipe at 640degreesC for 2 hours. Catalyst oxide particle was obtained. Oxide catalyst (45) was filled in a Vycor glass fluid bed type reaction tube. A mixed gas of propane, ammonia, oxygen and helium in a molar ratio of 1:0.6:1.5:5.6 was supplied to the tube. The reaction was performed at 440degreesC and at normal pressure. The conversion ratio of propane was 50.5% and selectivity of acrylonitrile was 66.7%.

L29 ANSWER 4 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2003-724066 [69] WPIX

CR 2002-115960 [16]

DNC C2003-199410

TI Catalyst for selective preparation of unsaturated nitriles from corresponding olefins, comprises mixed oxide containing bismuth, molybdenum, vanadium, antimony and niobium.

DC A41 E16 J04

PA (ABDULWAHED M; (YAHY-I) YAHYAOUI K E

CYC 1

PI JP 2001259420 A 20010925 (200369)* 30 B01J023-31

ADT JP 2001259420 A JP 2001-69672 20010313

PRAI US 2000-189215P 20000314

IC ICM B01J023-31

ICS B01J037-04; C07C253-24; C07C255-08

ICA C07B061-00

AB JP2001259420 A UPAB: 20031027

NOVELTY - A catalyst for selective preparation of unsaturated nitriles from corresponding olefins, comprises mixed oxide containing bismuth, molybdenum, vanadium, antimony and niobium, and optionally at least one element selected from groups VB, VIB, VIIB, and VIII, and at least one alkali promoter selected from groups IA and IIA

DETAILED DESCRIPTION - A catalyst has an atomic ratio shown by specific empirical formula of $BiaMnbVcSbdNbeAfBgOx$.

A = at least one element selected from groups VB, VIB, VIIB, and VIII;

B = at least one alkali promoter selected from groups IA and IIA;

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a = 0.01-12;
b = 0.01-12;
c = 0.01-2;
d = 0.01-10;
e = 0.01-1;
f = 0-2;
g = 0-1; and

```

x = number of oxygen atoms required to satisfy the valency requirements of the elements present.

An INDEPENDENT CLAIM is included for a method for preparing the catalyst for olefin ammonoxidation, comprising:

- (a) preparing a vanadium antimonate phase by heating a slurry of vanadium oxide and antimony oxide to form a vanadium-antimony paste and subsequently drying the paste and calcining to form the vanadium antimonate phase;
- (b) preparing a niobium-molybdenum solution;
- (c) preparing bismuth, niobium, and molybdenum mixed oxide hydrates at room temperature and without heat treating the mixed oxide hydrates;
- (d) combining the vanadium antimonate phase, the mixed oxide hydrates and a support thereby forming a catalyst precursor mixture;
- (e) stirring the catalyst precursor mixture for a period of time sufficient to form a catalyst precursor paste; and
- (f) drying the catalyst precursor paste to form a dried catalyst precursor material and calcining the dried catalyst precursor material to form the catalyst.

USE - For selective preparation of unsaturated nitriles from corresponding olefins.

ADVANTAGE - The catalyst for selective preparation of unsaturated nitriles from corresponding olefins, has high activity.

Dwg.1/1

FS CPI

FA AB; GI; DCN

MC CPI: A01-D04; E10-A15B; E31-M; J04-E04A; N03-C01; N03-C03;
N03-D02; N03-H; N06-E01

TECH UPTX: 20031027

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Method: The vanadium oxide is V2O5.

The antimony oxide is Sb2O3.

The calcining in step (a) is at most preferably 750 degreesC, in the presence of air.

The niobium-molybdenum solution is prepared at a pH of most preferably 3.5-5.

Step (c) comprises adding bismuth to the niobium-molybdenum solution and precipitating the mixed oxide hydrates at room temperature and without heat treating of the mixed oxide hydrates.

Step (c) comprises rash co-precipitation of bismuth, niobium, and molybdenum mixed oxide hydrates.

Step (c) comprises adding a solution containing bismuth to the niobium-molybdenum solution.

Step (d) comprises incorporating the vanadium antimonate phase and the mixed oxide hydrates in pre-acidified silica colloidal.

The method further comprises boiling the catalyst precursor mixture to form the catalyst precursor paste.

The stirring in step (e) is vigorous stirring.

The catalyst precursor paste is dried at most preferably about 120 degreesC

The calcining of the dried catalyst precursor material is at most preferably about 550 degreesC, in the presence of air.

The support is selected from silica, alumina, zirconia, titania, alumina, silicon carbide, alumina-silica, inorganic phosphates, silicates,

aluminates, borates and carbonates, pumice, montmorillonite, or mixtures thereof.

The support is pre-acidified silica.

The catalyst comprises 40-70 weight% of the support.

The catalyst contains niobium derived from niobium pentoxide, or from a niobium source soluble in water.

The niobium-molybdenum solution is prepared using niobium derived from niobium pentoxide.

Step (a) comprises drying the paste at most preferably about 120 degreesC.

ABEX UPTX: 20031027

DEFINITIONS - Preferred Definitions:

f = 0.01-1;

g = 0.001-0.5.

L29 ANSWER 5 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2002-407480 [44] WPIX

DNC C2002-114531

TI Catalyst, used in vapor phase catalytic oxidation to produce unsaturated nitriles and unsaturated carboxylic acids, comprising a promoted mixed metal oxide having specified formula is new.

DC A41 E16 E17 J04

IN CHATURVEDI, S; GAFFNEY, A M; HAN, S; HEFFNER, M D; LE, D H N; SONG, R; VICKERY, E M; NHU LE, D H

PA (ROHM) ROHM & HAAS CO; (CHAT-I) CHATURVEDI S; (GAFF-I) GAFFNEY A M; (HANS-I) HAN S; (HEFF-I) HEFFNER M D; (LEDH-I) NHU LE D H; (SONG-I) SONG R; (VICK-I) VICKERY E M

CYC 32

PI EP 1192987 A1 20020403 (200244)* EN 21 B01J023-00

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
RO SE SI TR

BR 2001004285 A 20020507 (200244) B01J023-16

US 6407280 B1 20020618 (200244) B01J023-64

US 2002065431 A1 20020530 (200244) C07C051-16

CN 1347756 A 20020508 (200253) B01J023-24

JP 2002177784 A 20020625 (200256) 21 B01J027-057

KR 2002030013 A 20020422 (200269) B01J023-64

US 6504053 B1 20030107 (200306) C07C051-16

MX 2001009742 A1 20020501 (200368) B01J023-00

ADT EP 1192987 A1 EP 2001-308131 20010925; BR 2001004285 A BR 2001-4285
20010927; US 6407280 B1 Provisional US 2000-235979P 20000928, Provisional
US 2000-235984P 20000928, Provisional US 2000-236000P 20000928,
Provisional US 2000-236130P 20000928, Provisional US 2001-286219P
20010425, US 2001-928197 20010810; US 2002065431 A1 Provisional US
2000-235979P 20000928, Provisional US 2000-235984P 20000928, Provisional
US 2000-236000P 20000928, Provisional US 2000-236130P 20000928,
Provisional US 2001-286219P 20010425, US 2001-928197 20010810; CN 1347756
A CN 2001-140941 20010927; JP 2002177784 A JP 2001-300840 20010928; KR
2002030013 A KR 2001-58666 20010921; US 6504053 B1 Provisional US
2000-235979P 20000928, Provisional US 2000-235984P 20000928, Provisional
US 2000-236000P 20000928, Provisional US 2000-236130P 20000928,
Provisional US 2001-286219P 20010425, Div ex US 2001-928197 20010810, US
2002-144924 20020514; MX 2001009742 A1 MX 2001-9742 20010927

FDT US 6504053 B1 Div ex US 6407280

PRAI US 2001-928197 20010810; US 2000-235979P 20000928;

US 2000-235984P 20000928; US 2000-236000P 20000928;

US 2000-236130P 20000928; US 2001-286219P 20010425;

US 2002-144924 20020514

IC ICM B01J023-00; B01J023-16; B01J023-24; B01J023-64; B01J027-057;
C07C051-16

ICS B01J021-12; B01J021-14; B01J023-28; B01J023-48; B01J023-54;

B01J023-76; B01J037-04; C07C051-00; C07C051-215;
 C07C051-25; C07C057-05; C07C253-00; C07C253-18; C07C253-24;
 C07C253-26; C07C255-08

ICA C07B061-00

AB EP 1192987 A UPAB: 20020711

NOVELTY - Catalyst comprising a promoted mixed metal oxide having specified formula is new.

DETAILED DESCRIPTION - Catalyst comprising a promoted mixed metal oxide of formula (I) is new.

AaMbNcXdZeOf (I)

A = Mo or W;

M = V or Ce;

N = Te, Sb or Se;

X = Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Sb, Bi, B,

In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P,
 Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb or Lu;

Z = Ni, Pd, Cu, Ag or Au;

a = 1;

b, c and d = 0.01 to 1.0;

e = 0.001 to 0.1; and

f = dependent on the oxidation state of the other elements.

INDEPENDENT CLAIMS are included for (i) the production of unsaturated carboxylic acids, comprising vapor phase catalytic oxidation of an alkane or alkane/alkene mixture, in the presence of the catalyst; and (ii) the production of unsaturated nitriles, comprising vapor phase catalytic oxidation of an alkane or alkane/alkene mixture and ammonia, in the presence of the catalyst.

USE - Used to produce unsaturated nitriles, such as acrylonitrile and methacrylonitrile, which are important intermediates for the preparation of fibers, synthetic resins, synthetic rubber etc. The catalyst is also used to produce unsaturated carboxylic acids, such as acrylic acid and methacrylic acid, which are important intermediates for the preparation of synthetic resins, coating materials, and plasticizers.

ADVANTAGE - The catalysts have enhanced activity and selectivity, leading to a improvement in the yield of the desired reaction product.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-D08; E10-A15B; E10-C04G; E10-C04H; E31-G;
 E31-K01; E31-L; E31-M; E31-Q08; E35; J04-E01; J04-E04; N01;
 N02; N03; N04-A; N04-B; N07-C

TECH UPTX: 20020711

TECHNOLOGY FOCUS - POLYMERS - Preferred Process: The catalyst is prepared by admixing compounds of the elements and at least one solvent; removing the solvent from the admixture to obtain a catalyst precursor; and calcinating the catalyst precursor.

ABEX UPTX: 20020711

DEFINITIONS - Preferred Definitions:

M = V;

N = Te and/or Sb;

X = Nb;

A = Mo;

N = Te; and

at least one of A, M, N, X and Z I = an oxygen-containing compound.

L29 ANSWER 6 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2002-407478 [44] WPIX

DNC C2002-114529

TI Catalyst, used in vapor phase catalytic oxidation to produce unsaturated nitriles and unsaturated carboxylic acids, comprising a promoted mixed

metal oxide having specified formula is new.

DC A41 E16 E17 J04

IN CHATURVEDI, S; GAFFNEY, A M; HAN, S; HEFFNER, M D; SONG, R; HEFENER, M D;

BARRETT, G; DAVIS, D

PA (ROHM) ROHM & HAAS CO; (CHAT-I) CHATURVEDI S; (GAFF-I) GAFFNEY A M;

(HANS-I) HAN S; (HEFF-I) HEFFNER M D; (SONG-I) SONG R; (HEFE-I) HEFENER M D; (BARR-I) BARRETT G; (DAVI-I) DAVIS D

CYC 32

PI EP 1192984 A1 20020403 (200244)* EN 16 B01J023-00
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
 RO SE SI TR

US 2002058835	A1 20020516 (200244)	B01J021-08
BR 2001004319	A 20020604 (200246)	B01J023-16
CN 1346699	A 20020501 (200252)	B01J023-24
KR 2002030012	A 20020422 (200269)	B01J023-64
US 6461996	B2 20021008 (200269)	B01J023-00
US 2003018208	A1 20030123 (200310)	B01J023-00
US 2003028399	A1 20030206 (200313)	G06F017-60
JP 2003053190	A 20030225 (200324)	48 B01J027-132
US 2003176734	A1 20030918 (200362)	C07C051-16
US 6624111	B2 20030923 (200364)	B01J023-22
US 6747168	B2 20040608 (200437)	C07C253-24
TW 574070	A 20040201 (200453)	B01J023-16

ADT EP 1192984 A1 EP 2001-308121 20010925; US 2002058835 A1 Provisional US 2000-235977P 20000928, Provisional US 2000-236261P 20000928, Provisional US 2000-236262P 20000928, Provisional US 2000-236263P 20000928, US 2001-927941 20010810; BR 2001004319 A BR 2001-4319 20010927; CN 1346699 A CN 2001-140930 20010927; KR 2002030012 A KR 2001-58665 20010921; US 6461996 B2 Provisional US 2000-235977P 20000928, Provisional US 2000-236261P 20000928, Provisional US 2000-236262P 20000928, Provisional US 2000-236263P 20000928, US 2001-927941 20010810; US 2003018208 A1 Provisional US 2000-235977P 20000928, Provisional US 2000-236261P 20000928, Provisional US 2000-236262P 20000928, Provisional US 2000-236263P 20000928, Div ex US 2001-927941 20010810, US 2002-225709 20020822; US 2003028399 A1 Provisional US 2000-235977P 20000928, US 2001-963099 20010924; JP 2003053190 A JP 2001-315888 20011012; US 2003176734 A1 Provisional US 2000-235977P 20000928, Provisional US 2000-236261P 20000928, Provisional US 2000-236262P 20000928, Provisional US 2000-236263P 20000928, Div ex US 2001-927941 20010810, Div ex US 2002-225709 20020822, US 2003-444599 20030522; US 6624111 B2 Provisional US 2000-235977P 20000928, Provisional US 2000-236261P 20000928, Provisional US 2000-236262P 20000928, Provisional US 2000-236263P 20000928, Div ex US 2001-927941 20010810, US 2002-225709 20020822; US 6747168 B2 Provisional US 2000-235977P 20000928, Provisional US 2000-236261P 20000928, Provisional US 2000-236262P 20000928, Provisional US 2000-236263P 20000928, Div ex US 2001-927941 20010810, Div ex US 2002-225709 20020822, US 2003-444599 20030522; TW 574070 A TW 2001-123927 20010927

FDT US 2003018208 A1 Div ex US 6461996; US 2003176734 A1 Div ex US 6461996; US 6624111 B2 Div ex US 6461996; US 6747168 B2 Div ex US 6461996, Div ex US 6624111

PRAI US 2001-927941 20010810; US 2000-235977P 20000928;
 US 2000-236261P 20000928; US 2000-236262P 20000928;
 US 2000-236263P 20000928; US 2002-225709 20020822;
 US 2001-963099 20010924; US 2003-444599 20030522

IC ICM B01J021-08; B01J023-00; B01J023-16; B01J023-22; B01J023-24;
 B01J023-64; B01J027-132; C07C051-16; C07C253-24; G06F017-60
 ICS B01J021-12; B01J021-14; B01J023-28; B01J023-54; B01J023-76;
 B01J027-057; B01J037-03; B01J037-04;
 B01J037-22; C07C051-00; C07C051-215; C07C051-25; C07C057-05;

C07C253-00; C07C253-18; C07C253-26; C07C253-28; C07C255-08

ICA C07B061-00

AB EP 1192984 A UPAB: 20030312

NOVELTY - Catalyst comprising a promoted mixed metal oxide having specified formula is new.

DETAILED DESCRIPTION - Catalyst comprising a promoted mixed metal oxide of formula (I) is new.

AaMbNcXdZeOf (I)

A = Mo or W;

M = V or Ce;

N = Te, Sb or Se;

X = Nb, Ta, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pt, Sb, Bi, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Ra, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb or Lu;

Z = Br, Cl, F or I;

a = 1;

b, c and d = 0.01 to 1.0;

e = 0.001 to 0.1; and

f = dependent on the oxidation state of the other elements.

INDEPENDENT CLAIMS are included for (i) the production of unsaturated carboxylic acids, comprising vapor phase catalytic oxidation of an alkane or alkane/alkene mixture, in the presence of the catalyst; and (ii) the production of unsaturated nitriles, comprising vapor phase catalytic oxidation of an alkane or alkane/alkene mixture and ammonia, in the presence of the catalyst.

USE - Used to produce unsaturated nitriles, such as acrylonitrile and methacrylonitrile, which are important intermediates for the preparation of fibers, synthetic resins, synthetic rubber etc. The catalyst is also used to produce unsaturated carboxylic acids, such as acrylic acid and methacrylic acid, which are important intermediates for the preparation of synthetic resins, coating materials, and plasticizers.

ADVANTAGE - The catalysts have enhanced activity and selectivity, leading to a improvement in the yield of the desired reaction product.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-D08; E10-A15B; E10-C04G; E10-C04H; E31-G; E31-K01; E31-L; E31-M; E31-Q08; E35; J04-E04; N01; N02; N03; N04-A; N04-B; N07-C

TECH UPTX: 20020711

TECHNOLOGY FOCUS - POLYMERS - Preferred Process: The catalyst is prepared by admixing compounds of the elements and at least one solvent; removing the solvent from the admixture to obtain a catalyst precursor; and calcinating the catalyst precursor (optionally in the presence of a source of halogen, preferably is Br, Cl, F or I).

ABEX UPTX: 20020711

DEFINITIONS - Preferred Definitions:

M = V;

N = Te and/or Sb, preferably Te;

X = Nb; and

A = Mo.

L29 ANSWER 7 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2002-174366 [23] WPIX

DNC C2002-054155

TI Composite metal oxide catalyst for production of carboxylic acid, is obtained by calcining precursor having preset diffraction peak in specific diffraction angle according to X-ray diffraction.

DC A41 E16

PA (MITU) MITSUBISHI CHEM CORP

CYC 1

PI JP 2001300311 A 20011030 (200223)* 5 B01J023-28 <--

ADT JP 2001300311 A JP 2000-125534 20000426

PRAI JP 2000-125534 20000426

IC ICM B01J023-28

ICS B01J037-04; C01B019-00; C07C253-24; C07C255-08

ICA C07B061-00

AB JP2001300311 A UPAB: 20020411

NOVELTY - The composite metal oxide catalyst containing molybdenum, vanadium, niobium and tellurium is formed by calcining the precursor. The precursor has the diffraction peak in diffraction angle (2 theta) of 22.1 plus or minus 0.5 deg., in the X-ray diffraction by Cu-K alpha rays.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following: (i) Manufacture of carboxylic acid and/or nitrile, involves performing gaseous phase catalytic oxidation of hydrocarbon using composite metal oxide catalyst; (ii) Manufacture of acrylonitrile, involves performing gaseous phase contact reaction of propane, ammonia and oxygen, using composite metal oxide catalyst.

USE - For production of carboxylic acid and/or nitrile by gaseous phase catalytic oxidation of hydrocarbon, and for production of acrylonitrile by gaseous phase contact reaction of propane, ammonia and nitrogen (claimed).

ADVANTAGE - Composite metal oxide catalyst containing molybdenum, vanadium, niobium and tellurium, having improved catalytic activity, is provided. Carboxylic acid, nitrile and acrylonitrile are effectively manufactured, using improved composite metal oxide catalyst.

DESCRIPTION OF DRAWING(S) - The figure shows the powder X-ray diffraction figure of precursor.

Dwg.1/2

FS CPI

FA AB; GI; DCN

MC CPI: A01-D04; E10-A15B; E10-A15D; E10-C04G1A; E10-C04G1B; E10-C04H;
E10-C04K; E31-G; N03-C; N03-D02; N04-A

TECH UPTX: 20020411

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Process: The solution containing precursor containing molybdenum, vanadium, niobium or tellurium is mixed with solution containing precursor containing all molybdenum, vanadium, niobium and tellurium. The solvent is removed from the mixed solution, to obtain a solid substance. The obtained solid is subjected to thermolysis at less than 400degreesC (preferably 200-400degreesC,) to obtain precursor. The obtained precursor is baked at 450-700degreesC, to obtain composite metal oxide catalyst. Preferred Composition: The composite metal oxide catalyst contains molybdenum/vanadium/niobium/tellurium in atomic ratio of 1/0.1-0.6/0.01-0.6/0.05-0.4.

ABEX UPTX: 20020411

EXAMPLE - (In kg) Para ammonium molybdateesterisktetrahydrate (7.09), ammonium meta-vanadate (1.41) and telluric acid (2.12) were added to 29.1 l of warm water, and dissolved. Silica-sol (5) containing 20 weight% (weight%) of silica was added to the obtained solution, to form reaction mixture. Niobium-ammonium oxalate (2.16) (mixture of (NH₄, H)₃ NbO₄ (C₂O₄)₃ and (NH₄, H)₂ Nb (OH) (C₂O₄)₂) containing 20.5 weight% of niobium, 54 weight% of oxalic acid and 5.1 weight% of niobium, was added to 8.66 l of warm water. The obtained solution was added to the formed reaction mixture, and the temperature was set to 50degreesC. The obtained slurry was maintained at 20-50degreesC for 16 hrs. The slurry was then spray dried at inlet gas temperature of 220degreesC and outlet gas temperature of 160degreesC, and cooled, to obtain precursor having diffraction peak in diffraction angle (2theta) of 22.18degrees. The atomic ratio of molybdenum:vanadium:niobium:tellurium (Mo:V:Nb:Te) in the obtained

precursor was 1:0.3:0.12:0.23. The precursor was then baked for 2 hrs at 600degreesC under nitrogen atmosphere to obtain composite metal oxide catalyst containing Mo:V:Nb:Te in atomic ratio of 1:0.3:0.12:0.15. The mean particle diameter of catalyst was 50mum. The obtained catalyst had excellent catalytic activity, when used in production of acrylonitrile.

L29 ANSWER 8 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2002-174365 [23] WPIX
 DNC C2002-054154
 TI Manufacture of metal oxide catalyst used for production of acrylic acid, involves adding niobium or tantalum compound to reaction mixture of compounds of vanadium ion, molybdenum ion and antimony ion, and calcining.
 DC A41 E17
 PA (TOAG) TOA GOSEI CHEM IND LTD
 CYC 1
 PI JP 2001300310 A 20011030 (200223)* 6 B01J023-28 <--
 ADT JP 2001300310 A JP 2000-117078 20000418
 PRAI JP 2000-117078 20000418
 IC ICM B01J023-28
 ICS B01J037-04; C07B061-00; C07C057-04
 ICA C07C051-225
 AB JP2001300310 A UPAB: 20020411
 NOVELTY - Vanadium ion (V5+) compound is continuously added to a reaction system containing molybdenum ion (Mo6+) compound and antimony ion (Sb3+) compound, and reacted in an aqueous medium at above 70 deg. C. Then, niobium compound or tantalum compound and optionally other metal compounds are added to the reaction mixture, mixed and calcined, to form a metal oxide catalyst.
 USE - For production of acrylic acid by gaseous phase catalytic oxidation of propane.
 ADVANTAGE - Acrylic acid is produced in high yield from propane, using the metal oxide catalyst.
 Dwg.0/0
 FS CPI
 FA AB; DCN
 MC CPI: A01-D08; E10-C04G; E31-M; E35-N; N03-C; N03-H;
 N06-E01; N07-C
 ABEX UPTX: 20020411
 EXAMPLE - (In g) Antimony trioxide (5.87) and ammonium molybdate (20.9) were added into a glass-made flask containing 30 ml of distilled water, in presence of nitrogen. The solution containing ammonium meta-vanadate (6.15), ammonium molybdate (10) and 140 ml of distilled water was supplied to a flask from a pump, and refluxed under boiling point temperature of water. Mixed gas of air/nitrogen containing 15% of oxygen was introduced at a flow rate of 100 ml/minute and cooled to room temperature, to obtain a blue colloid dispersion liquid. The aqueous solution containing 90 ml of distilled water, oxalic acid (13.15) and niobic acid (3.25), was added to the dispersion liquid, and stirred for 30 minutes. Then, ammonium nitrate (5) was added, and the obtained reaction mixture was concentrated by heating to 120degreesC. The obtained solid was then baked at 300degreesC for 5 hours and 600degreesC for 2 hours in presence of nitrogen, to obtain catalyst containing molybdenum/vanadium/antimony/niobium in an atomic ratio of 1/0.3/0.25/0.10. The obtained catalyst is mixed with cerite, ground, molded and used for acrylic acid production.

L29 ANSWER 9 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2000-053269 [04] WPIX
 DNC C2000-013918
 TI Catalyst composition used for polymerizing monomers, e.g. in ethylene polymerization.

DC A17 E11 E12
 IN BENHAM, E A; COLLINS, K S; HAWLEY, G R; JENSEN, M D; JOHNSON, M M; MARTIN, S J; McDANIEL, M P; SMITH, J L; WITTNER, C E; MACDANIEL, M P
 PA (PHIP) PHILLIPS PETROLEUM CO; (BENH-I) BENHAM E A; (COLL-I) COLLINS K S; (HAWL-I) HAWLEY G R; (JENS-I) JENSEN M D; (MART-I) MARTIN S J; (MCDA-I) McDANIEL M P; (SMIT-I) SMITH J L; (WITT-I) WITTNER C E
 CYC 86
 PI WO 9960033 A1 19991125 (200004)* EN 56 C08F004-642
 RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL
 OA PT SD SE SL SZ UG ZW
 W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB
 GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU
 LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR
 TT UA UG US UZ VN YU ZA ZW
 AU 9933618 A 19991206 (200019) C08F004-642
 US 6107230 A 20000822 (200042) B01J031-00
 BR 9910611 A 20010109 (200106) C08F004-642
 NO 2000005845 A 20010118 (200112) C08F004-642
 EP 1082355 A1 20010314 (200116) EN C08F004-642
 R: BE DE ES FI FR GB IT NL
 US 6300271 B1 20011009 (200162) B01J031-00
 KR 2001043678 A 20010525 (200168) C08F004-642
 CN 1307593 A 20010808 (200173) C08F004-642
 US 6316553 B1 20011113 (200173) C08F002-14
 HU 2001002282 A2 20011029 (200175) C08F004-642
 US 2002007023 A1 20020117 (200212) C08F004-44
 ZA 2000006699 A 20020424 (200237) 62 C08F000-00
 JP 2002515522 W 20020528 (200238) 75 C08F004-642
 MX 2000011174 A1 20030401 (200415) C08F010-00
 US 6831141 B2 20041214 (200501) C08F004-642
 RU 2251453 C2 20050510 (200532) B01J037-04 <--
 ADT WO 9960033 A1 WO 1999-US6373 19990324; AU 9933618 A AU 1999-33618
 19990324; US 6107230 A US 1998-80629 19980518; BR 9910611 A BR 1999-10611
 19990324, WO 1999-US6373 19990324; NO 2000005845 A WO 1999-US6373
 19990324, NO 2000-5845 20001117; EP 1082355 A1 EP 1999-914999 19990324, WO
 1999-US6373 19990324; US 6300271 B1 US 1998-80619 19980518; KR 2001043678
 A KR 2000-712883 20001116; CN 1307593 A CN 1999-807607 19990324; US
 6316553 B1 Div ex US 1998-80629 19980518, US 2000-561166 20000428; HU
 2001002282 A2 WO 1999-US6373 19990324, HU 2001-2282 19990324; US
 2002007023 A1 Div ex US 1998-80619 19980518, US 2001-909152 20010719; ZA
 2000006699 A ZA 2000-6699 20001116; JP 2002515522 W WO 1999-US6373
 19990324, JP 2000-549651 19990324; MX 2000011174 A1 WO 1999-US6373
 19990324, MX 2000-11174 20001114; US 6831141 B2 Div ex US 1998-80619
 19980518, US 2001-909152 20010719; RU 2251453 C2 WO 1999-US6373 19990324,
 RU 2000-131684 19990324
 FDT AU 9933618 A Based on WO 9960033; BR 9910611 A Based on WO 9960033; EP
 1082355 A1 Based on WO 9960033; US 6316553 B1 Div ex US 6107230; HU
 2001002282 A2 Based on WO 9960033; US 2002007023 A1 Div ex US 6300271; JP
 2002515522 W Based on WO 9960033; MX 2000011174 A1 Based on WO 9960033; US
 6831141 B2 Div ex US 6300271; RU 2251453 C2 Based on WO 9960033
 PRAI US 1998-80629 19980518; US 1998-80619 19980518;
 US 2000-561166 20000428; US 2001-909152 20010719
 IC ICM B01J031-00; B01J037-04; C08F000-00; C08F002-14; C08F004-44;
 C08F004-642; C08F010-00
 ICS B01J031-12; B01J031-14; C08F004-02
 AB WO 9960033 A UPAB: 20011129
 NOVELTY - Catalyst composition having greater activity when used in a
 polymerization process, comprises:
 (a) a treated solid oxide compound produced by contacting and
 calcining a solid oxide with an electron-withdrawing anion source;

(b) a metallocene compound of group IVA; and
organoaluminum compound.

DETAILED DESCRIPTION - Catalyst composition used for polymerizing monomers, comprises: an organometal compound of formula (I):

(X1) (X2) (X3) (X4) M1 (I)

M1 = Ti, Zr, Hf;

(X1) = Group OMC-I radical;

(X2) = Group OMCI or a group OMC-II radical;

(X3) and (X4) = Group OMC-II radical;

OMC-I = optionally substituted cyclopentadienyl, optionally substituted indenyl, optionally substituted fluorenyl, an organometallic, or H;

OMC-II = halide, aliphatic and/or cyclic, or organometallic group ; and a treated solid oxide compound; and an organoaluminum compound of formula (II):

Al(X5)_n(X6)_{3-n} (II)

X5 = 1-20C hydrocarbyl;

X6 = halide, hydride, or an alkoxide;

n = 1-3.

The treated solid oxide compound is produced by contacting and calcining a solid oxide with an electron-withdrawing anion source compound to form a mixture.

INDEPENDENT CLAIMS are also included for:

(1) a process of producing a catalyst composition used for polymerizing monomers, comprising contacting an organometallic compound, a treated solid oxide compound, and an organoaluminum compound; and

(2) a process for polymerizing a monomer with the catalyst composition.

USE - The catalyst is used for polymerizing monomers, e.g. in polymerizing ethylene. The polymer can then be formed into a manufacture that is used to form a machine part (claimed), or into e.g. household containers and utensils, drums, fuel, tanks, pipes, geomembranes, and liners.

ADVANTAGE - The composition which uses treated solid oxide can polymerize ethylene into a polymer with a greater activity (greater than 100 or 2,000 (gP/(gS-hr))) than the composition that uses untreated Ketjen grade B alumina (claimed).

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A02-A06E; A02-A07A; A02-D; A04-G02A; E05-B02; E05-E02; E05-T; E10-J02A2; E31-K01; E31-K07; E31-M; E31-P03; E31-Q04; E34-A; E34-C02; E34-D03; E34-E; E35-A; E35-C; E35-D; E35-F; E35-H; E35-K02; E35-L; E35-M; E35-N; E35-P; E35-Q; E35-S; E35-U02; E35-V; E35-W

TECH UPTX: 20000124

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Composition: The organometal compound is bis(cyclopentadienyl)hafnium dichloride, bis(cyclopentadienyl) zirconium dichloride, (ethyl(indenyl)2) hafnium dichloride, (ethyl(indenyl)2) zirconium dichloride, (ethyl(tetrahydroindenyl)2) hafnium dichloride, (ethyl(tetrahydroindenyl)2) zirconium dichloride, bis(n-butylcyclopentadienyl) hafnium dichloride, bis(n-butylcyclopentadienyl) zirconium dichloride, ((dimethyl)(diindenyl)silane) zirconium dichloride, ((dimethyl)(diindenyl)silane) hafnium dichloride, ((dimethyl)(ditetrahydroindenyl)silane) zirconium dichloride, ((dimethyl)(di(2-methylindenyl)silane) zirconium dichloride, or bis(fluorenyl) zirconium dichloride. The organoaluminum compound is tri(methyl-, ethyl, propyl, butyl-, or isobutyl-)aluminum, diethylaluminum ethoxide, triisobutylaluminum hydride, or diethylaluminum chloride. The solid oxide

compound comprises oxygen and a group 2-15 elements, including the lanthanides and the actinides, particularly Al₂O₃, B₂O₃, BeO, Bi₂O₃, CdO, CoO₄, Cr₂O₃, CuO, Fe₂O₃, Ga₂O₃, La₂O₃, Mn₂O₃, MoO₃, NiO, P₂O₅, Sb₂O₅, SiO₂, SnO₂, SrO, ThO₂, TiO₂, V₂O₅, WO₃, Y₂O₃, ZnO, ZrO₂, or its combinations. The solid oxide compound is preferably treated with fluoride and/or chloride.

Preferred Process: The process of polymerizing a monomer using the catalyst composition is preferably under slurry polymerization conditions in a loop reactor in the presence of a diluent comprising isobutane.

ABEX

UPTX: 20000124

EXAMPLE - A 2.26 gram sample of Davison 952 silica calcined in dry air was impregnated with 3.4 ml of trifluoromethane sulfonic acid (85.7% pure). The procedure under nitrogen in a flask. This material was then mixed with 8.96 g of calcined Ketjen grade B alumina. The resulting solid material was 79.9 weight % alumina, 29.1 weight % silica. The mixture was heated to 193-230 degrees C for 3 hours in nitrogen to allow the trifluoro-methane sulfonic acid to evaporate and react with alumina. The solid oxide formed was then treated with chloride and fluoride, and was charged to a reactor, followed by 2 ml of a solution of 0.5 g of bis(n-butylcyclopentadienyl) zirconium dichloride in 100 ml of toluene, followed by 0.6 liter of isobutane liquid, then 2.0 ml of 1M triethyl aluminum as cocatalyst, followed by another 0.6 liters of isobutane and finally the ethylene. The activity was then determined by recording the ethylene flow into the reactor. The recorded activity of the sample was 6,318 gP/gS-hr.

L29 ANSWER 10 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2000-041031 [04] WPIX
 CR 2003-150205 [15]
 DNC C2000-010854
 TI Preparation of multi-metal oxide catalyst, suitable for oxidation of alkanes to unsaturated aldehydes or carboxylic acids.
 DC A41 E19
 IN HANSEN, M W; LIN, M; LINSEN, M W
 PA (ROHM) ROHM & HAAS CO; (LINM-I) LIN M
 CYC 33
 PI EP 962253 A2 19991208 (200004)* EN 14 B01J037-02 <--
 R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
 RO SE SI
 CN 1236672 A 19991201 (200015) B01J037-00 <--
 JP 2000024501 A 20000125 (200016) 13 B01J027-057
 BR 9901568 A 19991221 (200017) B01J037-04 <--
 CA 2271397 A1 19991121 (200018) EN B01J023-00
 KR 99088461 A 19991227 (200059) B01J023-16
 US 6180825 B1 20010130 (200108) C07C051-16
 MX 9904691 A1 20000601 (200133) B01J023-54
 US 2001049336 A1 20011206 (200203) B01J023-00
 US 6514901 B1 20030204 (200313) B01J023-10
 US 6514903 B2 20030204 (200313) B01J023-10
 TW 486383 A 20020511 (200323) B01J023-00
 EP 1260495 B1 20040811 (200452) EN B01J037-02 <--
 R: BE DE ES FR GB IT NL SE
 ADT EP 962253 A2 EP 1999-303655 19990511; CN 1236672 A CN 1999-106467
 19990512; JP 2000024501 A JP 1999-141802 19990521; BR 9901568 A BR
 1999-1568 19990520; CA 2271397 A1 CA 1999-2271397 19990507; KR 99088461 A
 KR 1999-18390 19990521; US 6180825 B1 Provisional US 1998-86211P 19980521,
 US 1999-316007 19990521; MX 9904691 A1 MX 1999-4691 19990520; US
 2001049336 A1 Provisional US 1998-86211P 19980521, Div ex US 1999-316007
 19990521, US 1999-425671 19991022; US 6514901 B1 Provisional US
 1998-86211P 19980521, Div ex US 1999-316007 19990521, US 1999-425670
 19991022; US 6514903 B2 Provisional US 1998-86211P 19980521, Div ex US

1999-316007 19990521, US 1999-425671 19991022; TW 486383 A TW 1999-108383
 19990521; EP 1260495 B1 Div ex EP 1999-303655 19990511, EP 2002-9550
 19990511

FDT US 2001049336 A1 Div ex US 6180825; US 6514901 B1 Div ex US 6180825; US
 6514903 B2 Div ex US 6180825; EP 1260495 B1 Div ex EP 962253

PRAI US 1998-86211P 19980521; US 1999-316007 19990521;
 US 1999-425671 19991022; US 1999-425670 19991022

IC ICM B01J023-00; B01J023-10; B01J023-16; B01J023-54; B01J027-057;
 B01J037-00; B01J037-02; B01J037-04;
 C07C051-16

ICS B01J023-08; B01J023-20; B01J023-22; B01J023-26; B01J023-28;
 B01J023-42; B01J023-44; B01J023-63; B01J023-76; B01J023-887;
 B01J023-89; C07C045-33; C07C045-35; C07C047-055; C07C047-22;
 C07C051-215; C07C057-045; C07C057-05

ICA C07B061-00

AB EP 962253 A UPAB: 20040813

NOVELTY - Phase segregation during the preparation of a catalyst for the oxidation of alkanes to unsaturated aldehydes and carboxylic acids is minimized by forming a solution of metal compounds, removing the solvent, then calcining in an inert atmosphere.

DETAILED DESCRIPTION - A catalyst preparation method comprises:

- (a) dissolving metal compounds, at least one of which is an oxygen-containing compound, in at least one solvent;
- (b) removing the solvent from the resulting solution;
- (c) calcining the resulting precursor at 350-850 deg. C under an inert atmosphere to form a catalyst of formula (I):

AaMmNnXxOo (I)

a is greater than 0.25 and less than 0.9;
 m, n and x are each greater than 0.003 and less than 0.5;
 o is dependent on the oxidation state of the other elements;
 A = Mo, W, Fe, Nb, Ta, Zr, Ru or their mixture; M = V, Ce, Cr, or their mixture; N = Te, Bi, Sb, Se or their mixture; X = Nb, Ta, W, Ti, Al, Zr, Cr, Mn, Fe, Ru, Co, Rh, Ni, Pd, Pt, Sb, Bi, B, In, Ce or their mixture.

An INDEPENDENT CLAIM is also included for a catalyst of formula (I), where the catalyst has a surface area of 2-10 m²/g (determined by BET method).

USE - The catalyst is intended for use in converting alkanes to unsaturated aldehydes and carboxylic acids via a gas phase oxidation process (claimed).

ADVANTAGE - Phase segregation of the component elements is reduced and improvements are achieved in selectivity, conversion and yield.

Dwg.0/2

FS CPI

FA AB; DCN

MC CPI: A01-D08; E10-C04G; E10-C04H; E10-D01A; E10-D01B; E10-D01C;
 E31-G; E31-M; E31-Q08; E35; N01-D01; N02-E02;
 N02-F; N03

TECH UPTX: 20000124

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Solvent: in (a) the solvent is water.

Preferred Components: in (I)

A = Mo; M = V; N = Te; X = Nb; a is greater than 0.35 and less than 0.87; m is greater than 0.045 and less than 0.37; n is greater than 0.020 and less than 0.27; x is greater than 0.005 and less than 0.35.

Preferred Conditions: in (b) the solvent is removed by means of rotary evaporation, vacuum drying, air drying or freeze-drying; in (c) (I) is calcined at 400-700 (especially 500-640) degreesC in a non-flowing, inert atmosphere containing argon or nitrogen.

ABEX UPTX: 20000124

EXAMPLE - A sample of catalyst having the empirical formula Mo₁V_{0.3}Te_{0.23}Nb_{0.10}-0.12O_n was prepared by dissolving appropriate amounts of ammonium heptamolybdate tetrahydrate, ammonium metavanadate, telluric acid and niobium oxalate in water, removing the water from solution via a rotary evaporator, then calcining the catalyst precursor for 2 hours at 600 degreesC under argon in a non-flow environment. Granules of the catalyst product (10 g) were then packed into a U-tube reactor prior to gas phase oxidation of propane. The reaction was carried out at 390 degreesC using a propane/air/steam feed ratio of 1/15/14 and a space velocity of 1,200 per hour. Propane conversion, selectivity and yield (acrylic acid) indices of 69, 55 and 38% respectively were obtained as a result.

L29 ANSWER 11 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 1998-378926 [33] WPIX
 DNC C1998-115101
 TI Vanadium, antimony and tin oxide containing catalyst - prepared using tin oxide dispersion in tetraalkyl ammonium hydroxide solution and, useful for ammoxidation of 3-5C paraffins or olefins.
 DC A41 E18 J04
 IN BARTEK, J P; BRAZDIL, J F; BRAZDIL, A F
 PA (STAH) STANDARD OIL CO OHIO; (STAH) STANDARD OIL CO
 CYC 34
 PI EP 853977 A1 19980722 (199833)* EN 7 B01J023-22
 R: AL AT BE CH DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO
 SE SI
 JP 10225634 A 19980825 (199844) 8 B01J023-22
 ZA 9800258 A 19980930 (199844) 20 B01J000-00
 US 5854172 A 19981229 (199908) B01J023-00
 CN 1206627 A 19990203 (199924) B01J023-22
 BR 9800349 A 19990525 (199926) B01J037-04 <--
 US 5972833 A 19991026 (199952) B01J023-00
 KR 98070558 A 19981026 (199953) B01J023-62
 US 6087524 A 20000711 (200037) C07C253-00
 MX 9800508 A1 19990101 (200051) B01J023-18
 SG 77153 A1 20001219 (200106) B01J023-22
 RO 116253 B1 20001229 (200117) B01J023-18
 TW 425304 A 20010311 (200143) B01J023-00
 US 6372908 B1 20020416 (200232) C07D213-84
 MX 204942 B 20011025 (200279) B01J023-18
 RU 2195999 C2 20030110 (200319) B01J037-04 <--
 CN 1389457 A 20030108 (200334) C07C255-08
 EP 853977 B1 20031008 (200370) EN B01J023-22
 R: DE ES GB IT NL
 DE 69818718 E 20031113 (200382) B01J023-22
 ES 2209062 T3 20040616 (200442) B01J023-22
 CN 1104947 C 20030409 (200538) B01J023-22
 ADT EP 853977 A1 EP 1998-300250 19980114; JP 10225634 A JP 1998-6883 19980116;
 ZA 9800258 A ZA 1998-258 19980113; US 5854172 A US 1997-785543 19970117;
 CN 1206627 A CN 1998-105606 19980117; BR 9800349 A BR 1998-349 19980116;
 US 5972833 A Div ex US 1997-785543 19970117, US 1998-151463 19981109; KR
 98070558 A KR 1998-1133 19980116; US 6087524 A Cont of US 1997-785543
 19970117, Div ex US 1998-151463 19981109, US 1999-293452 19990416; MX
 9800508 A1 MX 1998-508 19980116; SG 77153 A1 SG 1998-60 19980106; RO
 116253 B1 RO 1998-65 19980115; TW 425304 A TW 1998-100547 19980116; US
 6372908 B1 Cont of US 1997-785543 19970117, Div ex US 1998-151463
 19981109, Div ex US 1999-293452 19990416, US 2000-567674 20000509; MX
 204942 B MX 1998-508 19980116; RU 2195999 C2 RU 1998-101417 19980116; CN
 1389457 A Div ex CN 1998-105606 19980117, CN 2002-105536 19980117; EP
 853977 B1 EP 1998-300250 19980114; DE 69818718 E DE 1998-618718 19980114,

EP 1998-300250 19980114; ES 2209062 T3 EP 1998-300250 19980114; CN 1104947
 C CN 1998-105606 19980117

FDT US 5972833 A Div ex US 5854172; US 6087524 A Cont of US 5854172, Div ex US 972833; US 6372908 B1 Cont of US 854172, Div ex US 5972833, Div ex US 087524; DE 69818718 E Based on EP 853977; ES 2209062 T3 Based on EP 853977

PRAI US 1997-785543 19970117; US 1998-151463 19981109;
 US 1999-293452 19990416; US 2000-567674 20000509

IC ICM B01J000-00; B01J023-00; B01J023-18; B01J023-22; B01J023-62;
 B01J037-04; C07C253-00; C07C255-08; C07D213-84

ICS B01J021-08; B01J023-14; B01J023-16; B01J023-20; B01J023-24;
 B01J023-26; B01J023-28; B01J023-30; B01J023-34;
 B01J023-847; B01J027-057; C07C051-265; C07C051-54; C07C063-15;
 C07C253-24; C07C253-26; C07C253-28; C07C255-51; C07D213-78;
 C07D253-26; C07D253-28

ICA C07B061-00

AB EP 853977 A UPAB: 19980819

A catalyst (I) containing vanadium, antimony and tin in the oxide state is prepared by making an aqueous slurry of a mixture (II) of compounds of the desired elements followed by drying and calcining the mixture to form active catalyst (I). (II) is a solution comprising SnO₂.xH₂O (where x at least 0) dispersed in a tetraalkyl ammonium hydroxide of formula (C_nH_{2n+14}NOH) (1). Also claimed is a process for making an alpha , beta -unsaturated mononitrile, preferably acrylonitrile or methacrylonitrile by the catalytic reaction in the vapour phase of propane or isobutane with oxygen and ammonia in the presence of a catalyst (I) of formula VSbmAaDdOx (2). The mole ratio of paraffin to NH₃ is 2.5-16 and the mole ratio of paraffin to O₂ is 1-10. n = 1-5; A = Ti and/or Sn where Sn is always present D = Li, Mg, Ca, Sr, Ba, Co, Fe, Cr, Ga, Ni, Zn, Ge, Nb, Zr, Mo, W, Cu, Te, Ta, Se, Bi, Ce, In, As, B, Al and/or Mn. m = 0.5 - 10; a = 0 - 10; d = 0-10; and x is determined by the oxidation state of the cations present.

USE - The catalyst (I) is useful for the ammoxidation 3-5C paraffins or olefins to the corresponding alpha , beta -unsaturated mononitrile. (I) is useful for the ammoxidation of methylpyridine, m-xylene or the oxidation of o-xylene to cyanopyridine, isophthalonitrile or phthalic anhydride respectively.

ADVANTAGE - The catalyst (I) is prepared in a cost effective manner by use of a tin oxide dispersion in a tetraalkyl ammonium hydroxide solution.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D04; A01-E11; E06-A02A; E10-A15A; E10-A15B; E10-A15D;
 E31-M; E31-Q08; J04-E04; N01; N02; N03

L29 ANSWER 12 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 1994-001089 [01] WPIX

DNC C1994-000433

TI Multi-metal oxide compsn., production - used in catalytic gas phase oxidation of organic cpds., especially unsatd. acid or aldehyde production, contg fine domains of bi metal oxide in matrix of different compsn..

DC A41 E16 J04

IN DOERFLINGER, W; MARTAN, H; NEUMANN, H; PETERSEN, H

PA (NEUM-I) NEUMANN H; (BAWI) BASF AG

CYC 11

PI EP 575897 A1 19931229 (199401)* GE 8 B01J023-88
 R: BE DE ES FR GB NL
 DE 4220859 A1 19940105 (199402) 6 C01G001-02

CA 2096081 A 19931226 (199411) C01B013-14
 CZ 9301053 A3 19940216 (199414) C01G001-02
 JP 06071177 A 19940315 (199415) 6 B01J023-88
 US 5364825 A 19941115 (199445) 7 B01J023-31
 CN 1087290 A 19940601 (199530) B01J023-00
 US 5449821 A 19950912 (199542) 5 C07C051-16
 EP 575897 B1 19960306 (199614) GE 18 B01J023-88
 R: BE DE ES FR GB NL
 DE 59301767 G 19960411 (199620) B01J023-88
 ES 2083799 T3 19960416 (199623) B01J023-88
 CZ 284491 B6 19981216 (199904) B01J023-88
 CN 1048652 C 20000126 (200464) B01J023-88
ADT EP 575897 A1 EP 1993-109741 19930618; DE 4220859 A1 DE 1992-4220859
 19920625; CA 2096081 A CA 1993-2096081 19930512; CZ 9301053 A3 CZ
 1993-1053 19930602; JP 06071177 A JP 1993-149012 19930621; US 5364825 A US
 1993-64428 19930521; CN 1087290 A CN 1993-107619 19930625; US 5449821 A
 Div ex US 1993-64428 19930521, US 1994-268504 19940630; EP 575897 B1 EP
 1993-109741 19930618; DE 59301767 G DE 1993-501767 19930618, EP
 1993-109741 19930618; ES 2083799 T3 EP 1993-109741 19930618; CZ 284491 B6
 CZ 1993-1053 19930602; CN 1048652 C CN 1993-107619 19930625
FDT US 5449821 A Div ex US 5364825; DE 59301767 G Based on EP 575897; ES
 2083799 T3 Based on EP 575897; CZ 284491 B6 Previous Publ. CZ 9301053
PRAI DE 1992-4220859 19920625
REP DE 3338380; EP 835; FR 2534904
IC ICM B01J023-00; B01J023-31; B01J023-88; C01B013-14; C01G001-02;
 C07C051-16
ICS B01J021-00; B01J021-02; B01J021-08; **B01J023-28**; B01J023-30;
 B01J023-84; B01J023-85; B01J023-887; B01J027-057; B01J027-18;
 B01J027-192; B01J027-199; **B01J037-04**; C01B033-00;
 C01G033-00; C07B033-00; C07C045-32; C07C047-21; C07C047-22;
 C07C051-21; C07C057-03; C07C057-04; C07C057-05; C07C253-26;
 C07C255-08
AB EP 575897 A UPAB: 19940217
 Multimetal oxide compsn. (I) is of the formula:

$$(X_1aX_2bO_x)p(X_3cX_4dX_5eX_6fX_7gX_2hO_y)^q \quad (IA)$$
 X1 is Bi, Te, Sb, Sn and/or Cu; X2 is Mo and/or W; X3 is an alkali metal, Tl and/or Sm; X4 is an alkaline earth metal, Ni, Co, Cu, Mn, Zn, Sn, Cd and/or Hg; X5 is Fe, Cr, Ce and/or V; X6 is P, As, B and/or Sb; X7 is a lanthanide metal, Ti, Zr, Nb, Ta, Re, Ru, Rh, Ag, Au, Al, Ga, In, Si, Ge, Pb, Th and/or U; a is 0.01-8; b is 0.1-30; c is 0-4; d and e are 0-20; f is 0-6; g is 0-15; h is 8-16; x and y are nos. determined by the valency and frequency of the various elements; the p/q ratio is 0.1-10.
 (I) contains 3D domains with a maximum dia. of 1-25 microns and the compsn. X1aX2bOx (IB), surrounded by material of different compsn..
 Pref. X1 is Bi; X1aX2bO is Bi₂W₂O₉.
 USE/ADVANTAGE - (I) is used as catalyst for gas phase catalytic oxidation of organic cpds., pref. for the production of 3-6C alpha,beta-monoethylenically unsatd. aldehydes and/or carboxylic acids from alkanes, alkanols, alkenes and/or alkenals with the same number of C atoms (claimed). It has higher activity and selectivity than usual.
 In an example, 50kg solution of Bi(NO₃)₃ in aqueous HNO₃ (11 (weight) % Bi, 6.4% HNO₃) were treated with 6.7kg H₂WO₄ and stirred 1 hr. at 50 deg.C. The suspension was spray dried and calcined 2 hrs. at 750 deg.C. The mix oxide (Bi₂W₂O₉ slightly contaminated with WO₃) was pulverised and classified to particle dia. fractions of (A) 0.1-1, (B) 1-5, (C) 5-10, (D) 10-15, (E) 15-20, (F) 20-25, (G) 30-50, (H) 90-120 microns, fractions (A, G, H) being controls. each fraction was mixed with 1% SiO₂ (number average dia. 28nm), giving starting material (1). A solution of 85.5kg ammonium molybdate in 240 l water was treated with a solution of 11.9kg Co(NO₃)₂ and 5.7kg Fe(NO₃)₃ in

80 l water and 7.8kg aqueous 20% colloidal SiO₂ and 377g aqueous 48% KOH solution.

The suspension was stirred for 3 hrs., then spray dried, giving starting material (2). (1) And (2) were mixed in the amts. required to give the compsn. (Bi₂W₂O₉)_{0.5}Mo₁₂Co₅Fe_{2.5}Si_{1.5}K_{0.05}O_x, pressed to hollow cylinders (5mm long, 5mm outside dia., 1.5mm wall thickness) and calcined 6 hrs. in air at 470 deg.C. The prods. contained domains of Bi₂W₂O₉ with about the same maximum dia. as the (1) fraction used, in a matrix of different compsn..

Dwg. 0/0

FS CPI

FA AB; DCN

MC CPI: A01-D05; A01-D08; E10-C04H; E10-D01B; E31-G; E31-K04;
E31-L; E35; J04-E04; N02; N03; N04-B

ABEQ US 5364825 A UPAB: 19950102

A compsn. of formula (I) is claimed. (X₁aX₂bO_x)_p(X₃cX₄dX₅eX₆fX₇gX₂hO_y)_q (I) in which X₁ is Bi, Te, Sb, Sn and/or Cu; X₂ is Mo and/or W; X₃ is alkali metal, Th and/or Sm; X₄ is alkaline earth metal, Ni, Co, Cu, Mn, Zn, Sn, Cd, and/or Hg; X₅ is Fe, Cr, Ce and/or V; X₆ is P, As, B and/or Sb; X₇ is a rare-earth metal, Ti, Zr, Nb, Ta, Re, Ru, Rh, Ag, Au, Al, Ga, In, Si etc.; a is 0.01-8; b is 0.1-30; c is 0-4; d is 0-20; e is 0-20; f is 0-6; g is 0-15; h is 8-16; x and y are determined by the valency and frequency of the elements in formula (I) other than O, and p and q are numbers whose ratio p/q is 0.1-10, contg. three-dimensional regions with a chemical formula X₁aX₂bO_x and a local environment, in which the regions are delimited from the local environment due to the chemical formula of the regions which is different from the local environment, in which at least 50% of the regions have a dia. of 1-25 microns.

USE/ADVANTAGE - The compsns. have increased activity and selectivity as catalysts for the gas-phase catalytic oxidn. of organic cpds., in partic. for the prepn. of unsatd. aldehydes and carboxylic acids.

Dwg. 0/0

ABEQ US 5449821 A UPAB: 19951026

Gas-phase catalytic oxidn. of (3-6C) alkane, alkanol, alkene or alkenal comprises (a) contacting starting material with a catalyst of formula \$ (X₁aX₂bO_x)_p(X₃cX₄dX₅eX₆fX₇gX₂hO_y)_q \$ contg. 3-dimensional regions with formula X₁aX₂bO_x and a local environment. Regions are delimited from the local environment due to formula of the regions which is different, such that 50% or more of the regions has max. dia. 1-25 microns.

X₁ is Be, Te, Sb, Sn and/or Cu; X₂ and M and/or W; X₃ is alkali metal, Th and/or Sm; X₄ is alkaline earth metal, Ni, Co, Cu, Mn, Zn, Sn, Cd and/or Hg; X₅ is Fe, Cr, Ce and/or V; X₆ is P, As, B and/or Sb; X₇ is a rare earth metal, Ti, Zr, Ni, Tl, Re, Ru, Rh, Ag, Au, Al, Ga, In, Si, Ge, Pb, Th and/or U; a is 0.01-8; b is 0.1-30; c is 0-4; d and e are each 0-20; f is 0-6; g is 0-15; h is 8-16; x and y are determined w.r.t. frequency and valency of corresp. elements; and ratio p/q is 0.1-10.

USE - In prodn. of olefinically-unsatd. aldehydes and/or carboxylic acids and corresp. nitriles.

Dwg. 0/0

ABEQ EP 575897 B UPAB: 19960405

A composition of the formula 1 (X₁aX₂bO_x)_p(X₃cX₄dX₅eX₆fX₇gX₂hO_y)_q (I), where X₁ is bismuth, tellurium, antimony, tin and/or copper, X₂ is molybdenum and/or tungsten; X₃ is an alkali metal, thallium and/or samarium; X₄ is an alkaline earth metal, nickel, cobalt, copper manganese, zinc tin, cadmium and/or mercury, X₅ is iron, chromium, cerium and/or vanadium, X₆ is phosphorus, arsenic, boron and/or antimony, X₇ is a rare earth metal, titanium, zirconium, niobium, tantalum, rhenium, ruthenium, rhodium, silver, gold, aluminium gallium, indium, silicon, germanium, lead, thoriump and/or uranium, a is from 0.01 to 8, b is from 0.1 to 30, c is from 0 to 4, d is from 0 to 20, e is from 0 to 2, f is from 0 to 6, g is from 0 to 6, g is from 0 to 15, h is from 8 to 16, x and y are numbers

determined by the valency and frequency of the elements in I or the other oxygen and p and q are numbers whose ratio p/q is from 0.1 to 10, contg. three dimensional regions, with a chemical composition $Z1aX2bOx$ which are delaminated from their local environment due to their chemical composition which is different from their local environment, and whose maximum diameter is from 1 to 25 micro-m.

Dwg.0/0

L29 ANSWER 13 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 1993-120540 [15] WPIX

DNC C1993-053212

TI Maleic anhydride synthesis catalyst preparation - by heating aqueous slurry containing molybdenum cpd. antimony cpd. and inorganic reducing agent, adding water, evaporating, drying and sintering.

DC A41 E13

PA (JAPG) NIPPON ZEON KK

CYC 1

PI JP 05057188 A 19930309 (199315)* 7 B01J023-28 <--

ADT JP 05057188 A JP 1991-248487 19910903

PRAI JP 1991-248487 19910903

IC ICM B01J023-28

ICS B01J023-88; B01J027-188; B01J037-04; C07D307-60

ICA C07B061-00

AB JP 05057188 A UPAB: 19931115

Catalyst containing Mo and Sb used in the synthesis of maleic anhydride by vapour phase oxidation of butadiene is prepared by concentrating aqueous slurry containing a Mo cpd., Sb cpd., and an inorganic reducing agent to paste by heating, adding water to obtain a suspension, evaporating the aqueous slurry solution to dryness, drying further and sintering.

ADVANTAGE - The catalyst obtd. has high activity.

In an example, to 1000 pts. ion-exchanged water, 300 pts. of ammonium molybdate and 50 pts. of antimony trioxide were added to obtain a suspension. The suspension was heated and when it reached 50 deg. C, 50 pts. of hydrazine hydrate was added to obtd. aqueous slurry solution. The aqueous

slurry solution was heated to 70-100 deg. C and concentrated to a paste with a solid content of 55% (process A). 700 parts of ion-exchanged water at 20 deg. C was added to the paste to obtain an aqueous slurry solution at a temperature of

up to 40 deg. C and with a solid content of up to 15% (process B). After repeating the processes A and B 3 times, the aqueous slurry solution was evaporated to dryness and dried in an oven at 110 deg. C for 12 hours. The solid was sieved to obtain 8-10 mesh uniform grains and sintered in tube furnace at 450 deg. C for 3 hours in an air current which had been adjusted to have an apparent contacting time with the solid of 1 sec

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-D08; A01-E12; E07-A01; E31-M; E32-A03; E35-Q;
N03-D; N03-H; N05-D; N06-E

L29 ANSWER 14 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 1984-141772 [23] WPIX

DNC C1984-059786

TI Regeneration of fluidised iron-antimony oxide catalysts - by adding volatile molybdenum component supported on further catalyst during catalyst use.

DC A41 E19 J04

IN KIYOMIYA, Y; NAKAMURA, T; NAKAMURA, Y; SASAKI, Y; YAMIGUCHI, M

PA (NITT) NITTO CHEM IND CO LTD
 CYC 7
 PI EP 109775 A 19840530 (198423)* EN 37
 R: AT DE GB IT NL
 JP 59076544 A 19840501 (198423)
 EP 109775 B 19860827 (198635) EN
 R: AT DE GB IT NL
 DE 3365703 G 19861002 (198641)
 US 4757038 A 19880712 (198830)
 JP 02056939 B 19901203 (199101)
 ADT EP 109775 A EP 1983-306457 19831025; JP 59076544 A JP 1982-186746
 19821026; EP 109775 B EP 1983-306457 19831025; US 4757038 A US 1987-52226
 19870515; JP 02056939 B JP 1982-186746 19821026
 PRAI JP 1982-186746 19821026
 REP EP 57041; GB 2088738; GB 814073; GB 814075; US 3882159; US 3988359; US
 4208303
 IC B01J023-94; B01J027-28; B01J037-04; C01C003-02; C07B061-00;
 C07C120-14; C07C121-32; C07C253-26; C07C255-08
 AB EP 109775 A UPAB: 19970909
 Metallic oxide catalyst comprising (I) Fe, (II) Sb, (III) V, Mo and/or W
 and (IV) Te, opt. with other components, which has become deactivated by
 use for oxidation, ammoniudn. or oxidative dehydrogenation of organic cpd(s)
 in fluidised bed reactors, is regenerated by adding a sec ond catalyst
 comprising the above components (of same or different empirical formula)
 supporting a Mo component which is volatile or capable of forming a
 volatile component under reaction conditions.
 The Mo component pref. increases the Mo content of the whole catalyst
 mixture by 0.01-2 weight%. It is pref. molybdenum trioxide, molybdic acid,
 ammonium molybdate, ammonium paramolybdate or phosphomolybdc acid.
 Regeneration can be carried out without interrupting the reaction; it
 does not require additional equipment for introduction of a vapourised
 regenerator and does not result in dilution of the catalyst.
 Dwg.0/0
 FS CPI
 FA AB
 MC CPI: A01-D04; E10-A15B; E31-G; E35; J04-E05; N02-A01; N03-C;
 N03-D; N03-H; N04-A

L29 ANSWER 15 OF 15 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 1979-81992B [45] WPIX
 TI Catalyst for oxidation of propylene - contains chromium, molybdenum,
 tellurium and phosphorus oxide(s) and is used in acrylic acid and acrolein
 mfr..
 DC A41 E17 J04
 IN KUZNETSOV, V A; ROZHKOVA, E V; YAREMENKO, E I
 PA (AUPH-R) AS UKR PHYS CHEM
 CYC 1
 PI SU 648258 A 19790228 (197945)*
 PRAI SU 1977-2503527 19770701
 IC B01J023-16; B01J037-04; C07B003-00
 AB SU 648258 A UPAB: 19930901
 The catalyst is prepared by mixing chromium oxide (IV) with aqueous solns. of
 ammonium para-molybdate (V), telluric acid(VI) and ammonium dihydrogen
 phosphate(VII) followed by calcination at 625 degrees -650 degrees C.
 Calcination below 625 degrees C decreases the selectivity of the catalyst
 and above 650 degrees C its activity is reduced.
 The catalyst prepared as described above is more active. Used in the
 oxidation of propylene(I), the yield of acrylic acid (II) is <=67.1% and the
 total yield of (II) and acrolein(III) is 83.9%.
 FS CPI

FA AB
MC CPI: A01-D05; A01-D08; E10-C04G; E10-D01A; **E31-G**; E31-K01;
E35-P; **E35-Q**; J04-E04; **N03-D**; N04-A; N04-B

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